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A

COMPEND

OF THE

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BY

DAN'L E. HUGHES, M.D.,

CHIEF RESIDENT PHYSICIAN, PHILADELPHIA HOSPITAL; PHYSICIAN-IN-CHIEF, INSANE DEPARTMENT, PHILADELPHIA HOSPITAL; LATE DEMONSTRATOR OF CLINICAL MEDICINE IN THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA, ETC., ETC.

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INCLUDING A SECTION ON MENTAL DISEASES AND A VERY COMPLETE SECTION ON SKIN DISEASES.

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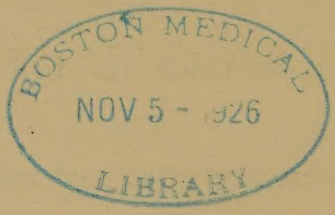

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TO

HIS ESTEEMED FRIEND AND TEACHER,

J. M. Da Costa, M.D.,

PROFESSOR OF THE PRACTICE OF MEDICINE IN THE JEFFERSON MEDICAL COLLEGE,

THIS COMPEND

IS RESPECTFULLY DEDICATED BY

THE AUTHOR.

PREFACE TO SIXTH EDITION.

The continued demand for the Compend of Medicine has encouraged the author to make its sixth edition the most complete of any similar book. It was never intended that the Compend should in any way replace the text-books upon the practice of medicine, but, on the contrary, it was written to be an aid to the medical student, at a time when practical demonstrations and ward classes were the exception in the college curriculum. The book has, however, somewhat outgrown the original plan, and having met with considerable favor from physicians, the author has endeavored to make it more useful to the profession without changing the arrangement which has made it so popular with the student, always keeping in mind, however, that it is a compend and not a treatise on medicine. The addition of the section on Mental Diseases has been kindly received, and has justified the statement in the preface to the fifth edition that no medical student's education should be considered as completed without some knowledge of insanity, the increase of which is the alarm of the closing hours of the century.

D. E. H.

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COMPEND

OF THE

PRACTICE OF MEDICINE.

INTRODUCTION.

The Principles of Medicine constitute what may be termed *Medical Science.*

The Practice of Medicine is the exercise of medical art, and embraces all that pertains to the knowledge of, prevention, and cure of the diseases which the physician is called upon to treat.

Disease may be defined as any departure from the normal standard of structure or function of an organ or tissue or in both combined: *Organic disease*, when associated with an organic change in the affected part; *Functional disease*, when the abnormal phenomena are independent of any discoverable structural lesion. It is questionable whether alterations of function can occur without alteration in structure.

The study of disease, whether organic or functional in character, is termed *Pathology.*

Pathology is the science that treats of disease in all its aspects, and explains the *origin*, *causes*, *clinical history*, and *nature* of the various morbid conditions which may disturb the economy.

The study of individual diseases constitutes *Special Pathology*,

while the study of the morbid conditions common to a greater or less number of diseases constitutes *General Pathology*.

Nomenclature, or the naming of diseases, is a subdivision of general pathology. The *real* value of nomenclature applied to disease is that the name chosen shall express the morbid condition involved, and, if possible, its location.

If the morbid condition be an inflammation, the suffix *itis* is added to the anatomical name of the part affected; thus, if the disease be an inflammation of the peritoneum, it is termed *peritonitis*.

If the morbid condition be catarrhal, such as a transudation or flux, the liquid escaping upon a mucous surface, the suffix *rhœa* is used; thus, a catarrhal inflammation of the intestinal tract is termed *diarrhœa* and *enterorrhœa*.

If the morbid condition be a flow of blood or a hemorrhage from a mucous surface, the suffix *rhagia* is used; thus, a hemorrhage from the small intestines is termed *enterorrhagia*.

If the morbid condition be pain without inflammation, the suffix *algia* is used. The various forms of neuralgias are examples; for instance, neuralgia of the stomach is termed *gastralgia*.

If the morbid condition be in the blood, the suffix *æmia* is used. Thus, *Anæmia* is impoverishment of the blood; *Uræmia*, the morbid accumulation of urea in the blood; *Septicæmia*, putrid infection of the blood; *Pyæmia*, purulent infection of the blood.

If the morbid condition be in the urine, the ending *uria* is used. *Albuminuria*, when albumin in the urine; *Hæmaturia*, when blood in the urine; *Oxaluria*, when oxalates occur in the urine.

If the morbid condition be a dropsical affection, the prefix *hydro* is added to the part affected. A dropsical accumulation in the peritoneum is termed *hydro-peritoneum*.

If the morbid condition be that of air in an unnatural part, the prefix *pneumo* to the name of the part is used, as in *pneumo-thorax*.

If the morbid condition be an inflammation of the membrane investing the part inflamed, the prefix *peri* is used. Thus, an inflammation of the investing membrane of the kidney is termed *perinephritis*.

Inflammation of the connective tissue surrounding an organ is designated by the prefix *para*. Thus, *parametritis* for inflammation of the connective tissue about the womb.

A termination in *oma* signifies a tumor, as in *sarcoma* or *carcinoma*.

The suffix *pathy* is used to designate a morbid condition of a part, without indicating its particular character, an example being the use of the term *encephalopathy*.

Morbid Anatomy, or pathological anatomy, a subdivision of pathology, is the study of the changes in the tissues and fluids of the body after death, appreciable either to the naked eye or with the aid of the microscope.

Bacteriology is that division of science concerned with the study of bacteria, an important and developing etiological factor in the field of medicine and surgery.

Histology is the study of the minute anatomy of the tissues and fluids of the body with the microscope and clinical chemistry.

Hæmatology, or the science of the blood, its nature, functions, and disorders.

Pathogenesis is the study of the origin and development of pathological processes or disease.

Lesions (*lædo*, to hurt) are appreciable anatomical changes.

Etiology is that subdivision of general pathology which treats of the causes of disease. The knowledge of the cause of any morbid action is of value in the prevention, management, and removal of disease.

The Causes of disease may be divided into *internal*, *external*, *ordinary*, *specific*, *primary*, *secondary*, *predisposing*, and *exciting*.

Examples of *internal* or *intrinsic causes* are those having their origin in the mind, such as prolonged mental application, intense or long-continued emotional excitement, long-continued mental depression, and the possession of and concentration upon a predominant idea. Other examples are the accumulation of certain products in the blood, such as urea, uric acid, or lactic acid, or the absorption of ptomaines from the gastric or intestinal tract.

External or *extrinsic causes* are such as infectious miasms, viruses, poisons, wounds, and injuries.

An *ordinary cause* is one to which all are more or less exposed, such as atmospheric changes.

Specific or *special causes* are those producing a distinct and specific disease, such as the *bacillus tuberculosis*, causing Tuberculosis; *comma bacillus*, Asiatic Cholera; *oscillaria malariæ*, Malaria; Löffler bacillus, Diphtheria.

A *contagious* disease is one whose causative agent is a specific

poison that, introduced into the system of another, will give rise to the same disease. An *infectious* disease is also due to a special cause that under certain conditions is capable of unlimited increase or multiplication. An infectious disease may or may not be contagious.

An example of a *primary cause* is any external traumatic injury.

A *secondary cause* is well seen in the secondary pericarditis resulting from an accumulation of urea in the blood, the retention of the urea in the blood being due to a diseased kidney.

A *predisposition* to disease is a special liability or susceptibility to its occurrence, and may be either *inherited* or *acquired*.

Inherited or *constitutional predisposition* to certain diseases is also termed *Diathesis;* an example is the offspring of phthisical parents, who are said to be of a *phthisical diathesis*.

Acquired predisposition is such as arises from—

I. *Habits:* Strain upon the nervous system resulting in nervous diseases, or the changes resulting from alcoholic or other excesses.

II. *Age:* Children are very liable to catarrhal disorders. Young adults, to fevers and perverted sexual disorders.
Middle age, to heart, kidney, and digestive disorders, and cancer.
Old age, to degeneration of the heart and vessels.

III. *Occupation:* Miners, weavers, and cutlers, lung diseases; or painters and printers, to lead colic.

IV. *Sex:* Women, emotional nervous diseases.
Men, as more exposed, rheumatism and pneumonia.

V. *Race:* Negro, phthisis and scrofula; often exempt from malaria.

Exciting causes are those giving rise to morbid conditions in individuals already predisposed to certain diseases, but lacking the action which determines their occurrence, to wit: persons predisposed to acute rheumatism, on being exposed to certain atmospheric changes have an attack; fear has produced chorea; anger has caused jaundice; worry has produced cardiac and mental diseases.

The Clinical History of diseases includes all the symptoms and signs which may occur from the *period of incubation* until its final *termination*.

Symptomatology is the study of the signs and symptoms of disease or such alterations in the healthy functions giving evidence of

the existence of a diseased condition or perverted function. Symptoms may be either *objective* or *subjective: Objective*, when evident to the senses of the observer, as redness, swelling, high temperature, or disorders of locomotion; *Subjective*, when felt or known only by the patient, such as pain, numbness, vertigo, or nausea.

Physical signs are, strictly speaking, objective symptoms, requiring for their elucidation special methods, such as *inspection*, *mensuration*, *palpation*, *percussion*, and *auscultation*. These methods are chiefly used in examinations of the chest and abdomen.

Associated with the study of symptomatology should be considered the *complications* and *sequelæ* of disease.

Complications are certain conditions which may arise during the course of the original disease, but are not considered necessary accompaniments of the disease; thus hemorrhage from the lungs or hæmoptysis is a complication of tuberculosis; intestinal hemorrhage, a frequent complication of typhoid fever.

Sequelæ (*sequor*, I follow) are the morbid phenomena left as a result of a disease; thus, valvular disease of the heart often results from an attack of acute articular rheumatism.

The Period of Incubation is that interval between the entrance of a poison into the system and the manifestation of its symptoms.

The Prodromes are the earliest recognizable symptoms; as the rigors or chills during the invasion of fever, and the various auræ preceding an epileptic attack.

An *acute disease* is one in which the invasion is sudden and rapid, and as a rule severe; when the symptoms develop less rapidly and are less intense, the disease is said to be *subacute;* when gradual or slow in development, duration, and intensity, the disease is said to be *chronic*. It must be borne in mind, however, that there may be disturbed action in every intermediate degree between these extremes.

Pathognomonic is the term applied to such symptoms as belong to one particular disease, and are therefore characteristic of it, thus: the rusty sputum of pneumonia, or the eruption of variola.

The Termination of a diseased action may occur in one of three ways, to wit: *Cure*, *Secondary Processes*, or in *Death*.

Cure may occur by—

Lysis, or slow return to health. *Crisis*, abrupt termination, usually

with a critical discharge. *Metastasis*, or changing from one location to another.

Secondary Processes are those in which the diseased action is substituted by a new morbid process, to wit: rheumatism followed by endocarditis; apoplexy by cerebral softening.

By *Death* is meant a complete cessation of tissue change occurring by—

Asthenia, or an ever-increasing debility, to wit: phthisis, cancer, Bright's disease. *Anæmia*, or insufficient quantity or quality of blood. *Apnœa*, or non-aeration of blood, to wit: acute lung diseases, or croup. *Coma*, death beginning at the brain, to wit: uræmia, narcotic poisoning, or cerebral hemorrhage.

Diagnosis of disease, or the discrimination of diseases, implies a complete, exact, and comprehensive knowledge of the phenomena under consideration, as regards the origin, seat, extent, and nature of all its morbid condition.

A direct diagnosis is made when the morbid condition is revealed by a combination of clinical phenomena, or some one or more pathognomonic symptoms.

A differential diagnosis is the result when the diseases resembling each other are called to mind and eliminated from each other.

A diagnosis by exclusion is by proving the absence of all diseases which might give rise to the symptoms observed, except one, the presence of which is not actually indicated by any positive symptoms.

The X- (or Röntgen) Rays, now in its infancy in diagnosis, will in the near future revolutionize the study of diseases of internal organs and structures.

Prognosis of disease is the ability or knowledge to foretell the most probable result of the condition present, and involves an amount of tact or knowledge only acquired by prolonged clinical experience.

Treatment. The ultimate and most important object in the study of medicine, from a practical point of view, is to be able to *cure*, *relieve*, or *prevent* disease. This *does not consist solely in the administration of drugs*, but requires strict and faithful attention to *diet*, *hygiene*, and *exercise*.

When the object is to prevent disease, such as small-pox by vaccination, it is called *Prophylactic* or *Preventive* treatment.

When disease is to be broken up, although already begun, such as aborting the chill of malaria, it is called the *Abortive* treatment.

When the disease is allowed to run its natural course without attempting its removal, but being constantly on the alert for obstacles to its successful issue, such as the generally adopted plan of treating continued fevers, it is called *Expectant* treatment.

When the disease is incurable, and removal of marked suffering is the object, it is called *Palliative* treatment.

When marked weakness and prostration are to be overcome, it is called *Restorative* treatment.

FEVERS.

Fever is a condition in which the temperature of the human body is raised above the normal limit,—98.2° F.,—and there are present the phenomena of *quickened circulation*, *marked tissue change*, and *disordered secretions*.

The *primary cause* of the fever phenomena is still a mooted question, and is either a disorder of the sympathetic nervous system giving rise to disturbances of the vaso-motor filaments, or a derangement of the nervous centres located adjacent to the corpus striatum, which have been found, by experiment, to govern the processes of heat production, distribution, and dissipation, or a toxæmia,—viz.: ptomaines, uræmia, or other poisons,—or of a bacterial origin.

Rise of temperature is the preëminent feature of all fevers, and can only be positively determined by the use of the clinical thermometer, The term *feverishness* is used when the temperature ranges from 99° to 100° F.; *slight fever* if 100° or 101°; *moderate*, 102° or 103°; *high* if 104° or 105°; and *intense* if it exceed the latter. The term hyperpyrexia is used when the temperature shows a tendency to remain at 106° F. and above.

Quickened circulation is the rule in fevers, the frequency usually maintaining a fair ratio with the increase of the temperature. A rise of *one* degree Fahrenheit is usually attended with an increase of *eight* to *ten* beats of the pulse per minute.

The following table gives a fair comparison between temperature and pulse:

A temperature of	98° F.	corresponds to a pulse of	60
" "	99° F.	" " "	70
" "	100° F.	" " "	80
" "	101° F.	" " "	90
" "	102° F.	" " "	100
" "	103° F.	" " "	110
" "	104° F.	" " "	120
" "	105° F.	" " "	130
" "	106° F.	" " "	140

The tissue waste is marked in proportion to the severity and duration of the febrile phenomena, being slight or nil in febricula, and excessive in typhoid fever.

The disordered secretions are manifested by the deficiency in the salivary, gastric, intestinal, and nephritic secretions, the tongue being furred, the mouth clammy, and there occurring anorexia, thirst, constipation, and scanty, high-colored, acid urine.

GENERAL TREATMENT OF FEVERS.

1. Reduce the temperature. The cold bath or cold pack will do this most decidedly, but entails much labor, and is not altogether free from danger, and so its use is advised only in proper cases. Cool sponging is of decided value. *Quininæ sulphas*, in gr. xx (1.3 Gm.) doses, repeated, rarely fails. *Antipyrin*, gr. xx (1.3 Gm.), repeated, *antifebrin*, gr. x–xv (0.65–1.0 Gm.), repeated, and *phenacetin*, gr. v (0.32 Gm.), repeated once or twice, are also recommended, but their tendency to depression must be watched.

2. Lessen the circulation. If the pulse be full, strong, and rapid, use *aconitum* or *veratrum viride*. If the circulation be weak, *stimulants* with *digitalis*, *caffeina*, and *nitroglycerin* are indicated.

3. Attend to the secretions. Remove the waste of the tissues by diuretics, diaphoretics, and, if particularly indicated, laxatives. It is better for every fever that the skin should be moist, than that it should be harsh and dry. It is better that the urine should be abundant, than that it should be scanty and thick with tissue waste. Watch the stools that you may judge whether the food, be it solid or liquid, is

properly digested. The free use of water is beneficial in promoting the various secretions.

4. Nourish the patient. "Don't starve a fever." Administer milk, beef-tea, animal broths, peptonized and other light nutritious food, in small quantities, but at frequent intervals, watching that tympanites does not develop.

Alcohol is only indicated in long-continued fevers or those of asthenic type. Check or discontinue alcohol when its odor is noticeable on the breath.

5. Watch the nursing. Much of the success in the management of fever patients can be attributed to good, sensible nursing. Through it are secured the five important essentials of every sick-room; to wit: cleanliness, cheerfulness, regularity, ventilation, and light.

CONTINUED FEVERS.

All continued fevers are characterized by a steady progress of the febrile movement, without either a too decided rise or fall in the temperature to modify the impression of a continuous action.

SIMPLE CONTINUED FEVER.

Synonyms. Irritative fever; febricula; ephemeral fever; synocha.

Definition. A continued fever, of short duration, mild in character, rarely fatal, but when death does occur, presenting no characteristic lesion.

Causes. Fatigue, mental and physical; exposure to the sun; great heat or cold; excesses in eating and drinking resulting in an attack of indigestion; excitement and violent emotion. Most common in childhood. It is not a miasmatic fever, neither is it contagious.

Symptoms. Onset sudden with an abrupt feeling of *lassitude*, followed by a decided *chill* or *chilliness*, a sudden and rapid *rise of temperature*, quick, *tense pulse*, *headache*, *dry skin*, *great thirst*, *coated tongue*, *costive bowels*, and *scanty*, *high-colored urine*. Cases due to errors in diet are accompanied by *nausea* and *vomiting*. Attacks occurring during childhood, due to excitement, fright, or the emotions, may be associated with *convulsions*. The *temperature* may within an

hour or two reach 103° F., or more, when slight *delirium* may occur. The affection has no constant or characteristic eruption.

Duration. From twenty-four hours to six or seven days.

Termination. Usually within a few hours, to a day or two, the temperature rapidly falls to the norm, an instance of *crisis;* or it may continue for several days, gradually falling to the norm (*lysis*). *Herpes* about the lips and nostrils are often observed at the close of an attack. *Convalescence* is rapid.

Diagnosis. Unless the fever can be attributed to some one of the causes mentioned, a doubt as to its character may exist for the first twenty-four hours, after which time it can hardly be mistaken for any other disease.

The following is a familiar instance of this affection. A child, apparently in the best of health, at play, or, may be, at school, suddenly complains of nausea and may vomit, the skin becoming hot, dry, and flushed, or soon covered with an erythematous rash; the pulse is quick and tense, there is headache, pains in the limbs, and great fretfulness or nervousness. The axillary temperature may reach 102°–104° F. The whole aspect is most alarming. A laxative is administered, the surface sponged with a tepid lotion, sleep follows, during which there may be free perspiration, and the following day the child is and continues perfectly well.

Prognosis. Recovery, without sequelæ, the rule.

Treatment. Rest in bed. If evidences of gastro-intestinal disorder be present, order a dozen or more powders containing *hydrargyri chloridi mite*, gr. ⅙ (0.01 Gm.); *sodii bicarbon.*, gr. ij (0.13 Gm.), *pulv. ipecac.*, gr. $\frac{1}{12}$ (0.005 Gm.), one every two hours, and some hours after the last powder has been taken, an enema or a *seidlitz powder*. Much comfort follows *sponging* the surface with tepid or cold water and the use of *saline diaphoretics* and *diuretics*. If the pulse be very quick, add small doses of *aconitum*. Cases not associated with digestive disorder have the fever and nervous symptoms relieved by *acetanilidum*, gr. ij–v (0.13–0.32 Gm.), according to age, every two or three hours. Liquid diet is the most palatable. Cases in which the nervous symptoms or insomnia are prominent should have a few doses of *potassii bromidum* during the day, or a bedtime dose of *trional*, gr. v–xx (0.32–1.3 Gm.). During convalescence tonic doses of *quininæ sulphas* or *tinctura nucis vomicæ*.

INFLUENZA.

Synonyms. La grippe; grip; contagious catarrh; epidemic or catarrhal fever.

Definition. An acute, specific, infectious fever, moderately contagious; sporadic, epidemic, and pandemic; associated with catarrhal inflammation of the respiratory tract, sometimes of the digestive, muscular pain, and always accompanied with disturbances of the nervous system and a *debility* out of all proportion to the intensity of the fever and the catarrhal processes and apt to be attended with serious complications and sequelæ.

The disease was almost unknown upon the appearance of the pandemic in the winter of 1889–90.

Causes. A specific poison, the *bacillus of Pfeiffer*, which is uninfluenced by soil, climate, season, or atmospheric changes. The mode of development of the remarkable outbreaks of influenza is not yet understood. One attack rather predisposes to another attack.

Morbid Anatomy. There are no characteristic anatomical lesions. Any anatomical changes are those of the complications.

Symptoms. The clinical history of this disease presents the greatest variations as regards intensity, from the most trifling indisposition in one, to an illness of the gravest kind, terminating in death, in another.

The onset is, in the majority of cases, sudden, with a *chill* or *chilliness* followed by *fever*, the temperature reaching 101° to 103°, a *quick, compressible pulse*, and severe *shooting pains* in the eyes and frontal sinuses and *myalgic* pains in the joints and muscles. The chill and fever are rapidly followed by *chilliness along the spine, pain in the throat, hoarseness, deafness, coryza, sneezing, injected, watery eyes*, and a dry, irritative, *laryngeal cough*, sometimes becoming *bronchial*. Rarely there is severe and obstinate cough, the result of a bronchial spasm, with little or no secretion. The *tongue* is furred, there is *anorexia, epigastric* distress, *nausea*, occasionally *vomiting*, and oftentimes *diarrhœa*. In some instances the digestive symptoms are the most prominent, when *dysentery* may occur. Associated with either the respiratory or digestive form of attack may be marked disturbances of the cerebro-spinal functions, or these latter may be the most prominent symptoms present.

The above symptoms are always associated with depression of

spirits, and a *debility* altogether out of proportion to the intensity of the fever and the catarrhal phenomena. Delirium is rare, but marked *hebetude* and *cutaneous hyperæsthesia* are common.

Duration. The fever declines in from four to seven days, when begins a protracted convalescence. Relapses frequently occur, and second, third, or even more numerous attacks in the same individual may be observed, the susceptibility of the system after an attack being remarkable.

Complications. The most frequent are those associated with the respiratory organs. Severe bronchitis, associated in the feeble or aged with fever, typhoid delirium, and tendency to œdema of the lungs. Croupous and catarrhal pneumonia are frequent and fatal complications. Cerebro-spinal meningitis is also noted.

Sequelæ. A persistent headache; neuralgia; neuritis; insomnia; neurasthenia or a confusional insanity; depression of spirits often obstinate and needing treatment; mania; enlargement of lymphatic glands. The great increase in pulmonary phthisis since the pandemic of 1889–90 is more than a coincidence.

Diagnosis. Isolated cases may be mistaken for a "bad cold." But when epidemic, the *sudden onset, marked general catarrh*, and *decided prostration* should prevent error.

At the onset of an epidemic Dengue will be remembered. Cerebro-Spinal Fever has many symptoms in common with the nervous form of influenza.

Prognosis. Recovery is the rule when it occurs in the healthy and vigorous; according to Pepper less than one-half of one per cent. die. *Grave* when the very young, the very old, or those suffering from organic disease, such as Bright's disease, fatty heart, emphysema, or the tubercular diathesis, are attacked.

Treatment. No specific. During the prevalence of the epidemic influence exposure to cold should be avoided. *Support* the system and pursue a purely symptomatic method of medication. All measures, of whatever kind, which tend to depress the general nervous system, or the functional activity of the respiration, and particularly the heart, are to be avoided. Patients should be kept in bed until fever declines or longer. Keep the bowels soluble. If many individuals must come in contact with the patient, some isolation and disinfection of the nasal and bronchial secretions should be practised.

The *catarrh*, *pains*, and *cough* are at least ameliorated by the following:

℞. Phenacetin., ... gr. iij .2 Gm.
Pulv. camphoræ, ... gr. j .065 Gm.
Caffeina citrata, ... gr. j .065 Gm.

Every two or three hours, alternated with *quininæ sulphas*, gr. ij (0.13 Gm.).

Excellent results follow the use of the following combination:

℞. Sodii benzoat., ... ʒij 8. Gm.
Salol, ... ʒss 2. Gm.
Phenacetin., ... gr. xl 2.6 Gm.
Strychninæ sulph., ... gr. ½ .012 Gm. M.

Ft. chart. vel capsul. No. xij.

Sig.—One every three or four hours.

Sodii benzoas, gr. x (0.65 Gm.) every four hours, is strongly recommended.

During the last pandemic the disease was frequently aborted in those of vigorous health by a few ten- or fifteen-grain (0.65–1 Gm.) doses of *antipyrin*, although in those of feeble resisting power much harm resulted from the indiscriminate use of this drug. Dr. Roland G. Curtin warmly recommends *salicinum* as coming "as near to being a specific as we can get with the drugs now in our possession." *Quininæ sulphas*, in full doses at the very onset, often aborts the disease.

I have seen excellent results in neuralgic cases from *cinchonidinæ salicylas*, gr. v (0.32 Gm.), every four hours.

The frequent inhalation of *tinctura benzoin. comp.*, fʒss–j (2–4 Cc.) in *aquæ bul.*, Oj (475 Cc.), relieves the naso-pharyngeal and bronchial catarrh.

If the *bronchial* symptoms become troublesome, use—

℞. Ammonii chlorid., ... gr. x .65 Gm.
Tinct. hyoscyami, ... ♏xv 1. Cc.
Syr. ipecac., ... ♏v .3 Cc.
Spts. frumenti, ... fʒss 2. Cc.
Aquæ chloroformi, ... fʒiss 6. Cc. M.

Every three or four hours, diluted.

The complication of *pneumonia* requires prompt stimulating treatment. Dr. Pepper recommends *strychninæ sulphas* in full doses as

the most important remedy against this complication, and suggests the following combination as often valuable:

℞. Morphinæ sulph., ... gr. j	.065	Gm.	
Quininæ sulph., ... gr. xxxv	2.3	Gm.	
Strychninæ sulph., ... gr. ss	.03	Gm.	
Acid. phos. dil., ... f℥ iij	12.	Cc.	
Glycerini, ... f℥ v	20.	Cc.	
Aquæ, ... q. s. ad f℥ iij	90.	Cc.	M.

Sig.—A teaspoonful four to six times daily, in water.

Dr. Bartholow recommends the early use of *pilocarpine*, gr. ⅙ (0.01 Gm.), repeated until its mild physiological effects ensue, when it is substituted by *duboisine*, gr. $\frac{1}{300}$–$\frac{1}{200}$ (0.00022–0.00032 Gm.), twice a day, and for the depression *ferri iodidum*, one of the official pills every four hours, and inhaling one or two drops of *pyridine* every few hours.

During convalescence administer *strychninæ sulphas*, gr. $\frac{1}{48}$ (0.0013 Gm.) four times daily.

Always have in mind that influenza is often the exciting cause of a phthisical development in those so predisposed. Insomnia is a symptom calling for prompt treatment. The anæmia and general weakness of convalescence calls for *ferrum*.

TYPHOID FEVER.

Synonyms. Enteric fever; gastric fever; nervous fever; entero-mesenteric fever; abdominal typhus; autumnal fever.

Definition. An acute, infectious *febrile* affection, due to a *special poison;* characterized by insidious prodromes, epistaxis, dull headache followed by stupor and delirium, red tongue, becoming dry, brown, and cracked, abdominal tenderness, early diarrhœa and tympany, and a peculiar eruption upon the abdomen; rapid prostration and slow convalescence; a *constant lesion* of Peyer's patches, the mesenteric glands, and enlargement of the spleen.

Causes. Predisposing and exciting.

The chief predisposing causes are *Age* and *Season*. It is claimed by Pepper that a particular susceptibility exists in certain individuals and families to typhoid fever.

The most frequent age is between fifteen and thirty years, and

cases are rarely seen in those of forty-five years and over. I have seen well-marked cases with typical symptoms at eighteen months, and at five years of age. The autumn months show the most cases, and particularly following a hot and dry summer.

The exciting cause is a *special typhoid germ, the typhoid bacillus* or *bacillus of Eberth*, which is found in the lesions and blood.

The poison usually results from the *decomposition* of the *typhoid stools and the sputum*, although it has been claimed that the disease may be generated under certain undetermined circumstances, *de novo*, from ordinary filth and decomposition; this view has less advocates each year.

The contagiousness of typhoid fever is again advanced.

The atmosphere is never impregnated with the fever germ. The poison gains its entrance into the system by means of infected water, milk, ice, meat, or other food. The germ is easily destroyed by thorough disinfection of the stools and sputum with heat, mercuric bichloride, or acidum carbolicum, but *extreme cold will not destroy* the typhoid germ.

Pathological Anatomy. The specific anatomical lesions of typhoid fever are invariably present, and are so characteristic that an examination of the body after death will in any case make known the nature of the disease, even had the symptoms been unknown. These lesions consist in changes in the *Peyerian patches* and *solitary glands*, which may be divided into well-defined stages, as follows:

First. Stage of Infiltration, or Swelling from infiltration and excessive proliferation of their cellular elements; the surrounding mucous membrane is also infiltrated with cells. The Peyer's patches are thickened, hardened, and elevated above the mucous membrane. The number of patches and glands involved is from three or four up to nearly the entire number. The above changes have been noted as early as the second day.

Second. Stage of Necrosis, Softening, or Sloughing of the solitary and agminate glands. Not all the patches necessarily slough; in a certain number of them the morbid changes are arrested before softening. This stage constitutes the anatomical changes of the second and third week.

Third. Stage of Ulceration following and depending directly upon the softening and sloughing, the sloughs gradually separating, beginning at the periphery of the swollen gland and finally, at about the

end of the third week, become detached, leaving ulcers of various sizes.

Fourth. Stage of Cicatrization, or in rare cases *Perforation.* The ulcer gradually diminishes in size, the surface becoming covered with a delicate layer of granulations, which is soon transformed into connective tissue and covered with epithelium, the resulting scar being slightly depressed. The gland-structure is never regenerated.

The *Mesenteric glands* become infiltrated, enlarged, and softened, but seldom ulcerate. In about one-third of the cases the large intestine is also involved.

The *Spleen* also enlarges and softens, the increase being twice or three times its normal size, beginning in the middle of the first week, and reaching its height at the end of the second week.

There are, besides, *parenchymatous degenerations*, or *granular changes* in all the active organs and tissues of the body.

Symptoms. *Stage of Prodromes.*—The onset is insidious, with a feeling of *general malaise*, vertigo, headache, particularly occipital pain, disordered digestion, disturbed sleep, *epistaxis*, depression, and muscular weakness, followed by a *chill* or *chilliness*, the patient being unable to designate the day when the symptoms began. In rare instances the disease begins abruptly with a chill, followed by high fever; this is particularly the case in malarial districts.

The exact duration of these premonitory symptoms is not known, and may be said to vary from a few days to two or three weeks.

First Week, dates from the onset of the fever, when are present *increasing temperature, frequent pulse, headache, listlessness*, the eyes closed as if asleep, *coated tongue, nausea, diarrhœa* (there may be constipation), the abdomen moderately distended and, upon pressure in the *right iliac fossa, gurgling sounds* and tenderness. Upon the *seventh day a few reddish spots resembling* flea bites appear upon the abdomen, chest, or back.

Second Week. The foregoing symptoms are exaggerated; *fever* is now continuous, with a frequent and *compressible* and dicrotic *pulse*, tympanitic, *tender abdomen, gurgling in the right iliac fossa, nocturnal delirium*, severe and constant *headache*, often *stupor*, a short *cough* with distinct *bronchial râles* on auscultation, irregular muscular contractions (*subsultus tendinum*), *sordes* upon the teeth and lips, the tongue losing its coating and becoming more or less dry, the *diarrhœa* continuing. During this stage *deafness* develops, often increasing

until profound, and continuing into convalescence. Disturbances of *vision* are frequent in pronounced cases. The *spleen* increased in size.

Third Week. *Fever* changes from continuous to remittent; the evening exacerbations continue as high as the preceding week, the morning fall growing more decided each day, but all the other symptoms remain about the same until near the end of the week, when a marked amelioration begins.

In a fair proportion of cases all the symptoms grow worse toward the end of the second or during the third week. The *prostration* is extreme, the *stupor* so marked that it is hardly possible to rouse the patient, the *tongue dry, hard*, cracked, and covered with a *brown crust, sordes* collect on the gums, teeth, and cracked lips, the *pulse* is rapid and feeble, the *respirations* shallow and quickened, *retention of urine*, which contains albumin. The *stools* are often voided involuntarily, and bed-sores develop, this condition terminating in death, or passing thus into the fourth week.

Fourth Week. The fever decidedly remits; almost normal in the morning, the pulse becoming less frequent and more full, the tongue gradually becoming clean, the abdomen lessens in size, the diarrhœa ceases, the patient passing into a slow convalescence, greatly emaciated, which convalescence may continue for several weeks.

Analysis of Symptoms. *The temperature record of typhoid fever is characteristic.* The fever on the morning of the first day may be stated at 98.5° F., evening 100.5°; second morning 99.5°, evening 101.5°; third morning 100.5°, evening 102.5°; fourth morning 101.5°, evening 103.5°; fifth evening 104.5°. From that time until end of the second week the evening temperature ranges between 103° and 105°, the morning temperature being a degree or more lower. During the second or third week *hyperpyrexia*, or fever above 105° F., may develop and adds to the gravity of the attack. A high temperature during the third and fourth week is of grave import. Temperatures of 106°–107° with recovery are reported, but they must be rare.

Afebrile cases of typhoid fever are reported, all other symptoms with the prostration, but the step-like temperature, being present.

Diarrhœa is the principal intestinal symptom; if absent, the lesion may be slight. The stools are at first dark, but early in the second week they become fluid, offensive, *ochre-yellow* in color, resembling "peasoup," and may be streaked with *blood* They number from *three* to *fifteen* during the twenty-four hours.

Constipation occurs more frequently than is supposed. I have seen one hundred cases with constipation within the past ten years.

The *urine* has the ordinary febrile characters. *Retention* is very common. Ehrlich describes a reaction which he believes is rarely met with save in typhoid fever. In examinations of the urine by Ehrlich's *diazo-reaction* in fifty cases of typhoid fever in the wards of the Philadelphia Hospital, the reaction was found in thirty-eight. It has also been found in a number of other conditions, particularly those having gastro-intestinal symptoms.

Eruption is almost constant. Consists of from *five* to *twenty* small, *rose-colored spots* on the *abdomen*, *chest*, or *back*, sometimes on the limbs, appearing in crops, lasting about *five days*, *disappearing on pressure* and at *death*. *Returning with relapses*. *Eruption* day from the *seventh* to the *ninth*.

Rarely spots of a delicate *blue* tint—the "taches bleuâtres" of French authors—are observed.

Nervous symptoms are, pronounced *headache*, early and severe, *dullness* of intellect soon following, passing into *drowsiness* and *stupor*, with great *prostration*. *Deafness* pronounced. Sight impaired, and in grave cases double vision. *Delirium* low and muttering, generally pleasant in character; always present in severe cases. *Coma vigil* is a grave symptom, the patient lying perfectly quiet with eyes open, taking no heed to his surroundings.

Splenic enlargement is an almost constant clinical feature. A vertical dullness exceeding two ribs and an interspace signifies enlargement. *Palpation* is a valuable aid for determining splenic enlargement.

Muscular symptoms are developed late in the second or early in the third week, and consist of irregular contractions, carphologia, or *subsultus tendinum*, and are the result of the great debility. The reverse of muscular contractions, to wit, lying perfectly motionless in bed, attempting no muscular effort of any kind, is a grave sign.

Convalescence shows great debility and emaciation, extreme anæmia, and severe nervousness, often very protracted. It is during convalescence that irritability of the heart, profuse night-sweats, and insomnia occur, and in women loss of hair.

Complications. *Intestinal hemorrhage* is the most frequent and at times the most critical of any of the complications of typhoid fever. The hemorrhage may occur any time between the fourteenth

and twentieth day; a sudden decline of the temperature to the norm or below frequently precedes the passage of blood by stool. The hemorrhage is due to the erosion of a vessel during the ulcerative stage.

Perforation makes the case almost hopeless. *Peritonitis* without perforation adds to the gravity, but is not necessarily fatal.

Lobar pneumonia, *hypostatic congestion*, and *bronchitis* are frequent occurrences. There are few cases that do not have slight bronchial cough from the onset. *Albuminuria* and *acute nephritis* may occur, as may *phlegmasia dolens*, the result of thrombosis of the femoral vein, usually the left. *Bed-sores* are frequent, resulting from the impaired nutrition, emaciation, and pressure over bony prominences, and the difficulty of keeping the patient clean.

Ulceration of the tongue and mucous membrane of the cheek is sometimes seen.

Sequelæ. *Paralysis*,—either mono- or paraplegia,—due to an acute neuritis. *Post-febrile insanity* occurs more frequently after typhoid than any other febrile condition, save influenza. *Acute Nephritis* associated with œdema. *Alopecia*, complete or partial. Transverse *markings* of the *nails*. *Tuberculosis* may develop in those predisposed.

These sequelæ of typhoid fever are all the result of the impaired nutrition and great prostration.

Relapses are common, Da Costa reporting five in one patient, and Wilson (J. C.) four in one of his cases. The symptoms all return abruptly; the duration is half the time of the original attack; occur at the end of the fourth or beginning of the fifth week. Not so fatal as generally supposed.

Abortive typhoid fever are cases of mild character, having many of the typical symptoms, running its course in about two weeks. The so-called *walking cases* are often of this character.

Diagnosis. The *Widal reaction* or serum-test gives brilliant promise for the early and correct diagnosis of the disease. Widal and others showed that "if *to* a drop of blood-serum, or to a drop of water containing a solution of dried blood from a typhoid patient, a moderate number of typhoid bacilli were added, a peculiar reaction occurred," seen under the microscope as a loss of the natural motility and an agglutination of the bacilli—a clumping into masses.

An error that is constantly being made is that of confounding

typhoid fever with the typhoid (depressing) symptoms or conditions developing during the course of many acute diseases. The absence of the characteristic *diarrhœa*, the peculiar *eruption*, and the typical *temperature* record and enlarged spleen should prevent the error.

Enteritis has intestinal derangement and an irregular fever course.

Peritonitis, abdominal symptoms only, with constipation and rapid early prostration and collapse.

Acute miliary tuberculosis is often mistaken for typhoid fever, an error difficult to prevent at times. The perfection of the Widal reaction and diazo-urine reaction may remove the doubtful points in the near future.

Meningitis lacks the intestinal symptoms and fever record.

The so-called *typho-malarial* or *malario typhoid* fever has many symptoms in common, but lacks the diarrhœa, eruption, and temperature record.

Prognosis. A positive prognosis cannot be made. Favorable indications are constipation, or slight diarrhœa, low temperature, and moderate delirium. Unfavorable symptoms are obstinate and severe diarrhœa, early high temperature, cardiac exhaustion, marked nervous symptoms with coma vigil or stupor, albuminuria, and repeated intestinal hemorrhages.

The prognosis is always more favorable in winter than in summer.

When death occurs, it is usually during or about the third week, the result of exhaustion, cardiac failure, or some complication. Children under puberty usually recover. More women than men die, although less women have the disease. Pregnant women and fleshy people usually succumb.

The *mortality* in typhoid fever in private practice is about one death in twenty; in hospital practice it varies from one death in five to ten cases, although the cold bath treatment has greatly reduced the hospital mortality.

Treatment. There is no specific treatment for typhoid fever. The indications are to sustain life and meet the urgent and dangerous symptoms as they arise.

Flint held that, as it was a self-limited disease, "if the patient can be kept alive after three, four, or more weeks, recovery will take place provided there be no serious complication. In a case of severe uncomplicated fever the patient is in a situation not unlike that of a

person in danger of drowning not far from or perhaps very near the shore. If he drown, it is because his strength gives way before the shore is reached. As a person in this situation requires only to be buoyed up by some support, so the fever patient in a similar emergency may only need supporting measures to live."

It is important to secure intelligent *nursing*, a quiet, airy sick-room with an average temperature of 65° F., and the most scrupulous *cleanliness* of patient, bedding, and utensils. The patient must go to bed from the moment of suspicion that typhoid fever is developing, and remain in bed until convalescence is well established.

The *stools* and *urine* must be *disinfected* the moment voided, and quickly discharged into a sewer or buried.

The *diet* should be nutritious and *liquid* at intervals of every two or three hours. *Diluted milk* is the best article, but broths, soups, liquid peptonoids, coffee, and cold milk and tea may be alternated. A word of caution, however, as to the quantity of food administered. The amount should be small, as the digestive capacity of the patient is greatly lessened by the febrile phenomena. Much harm results in typhoid fever from stuffing the patient. Watch stools for undigested milk.

The tendency to bed-sores must be kept in mind. The use of finely powdered boric acid over irritated parts will often prevent their development, or if developed, are healed by constant applications of *bovinine* on several layers of gauze.

Attention should be given to the mouth, and the dryness and tendency to collections of sordes prevented by frequently washing with glycerine and water or weak boric solution.

The following remedies have advocates, claiming that they modify the course of the disease: *hydrargyrum*, *iodum*, *acidum carbolicum*, *mineral acids*, *argentum nitras*, *guaiacum*, and *ergota*, but no *one* drug can claim specific action.

The *reduction of temperature* is one of the most important indications in the majority of cases of typhoid fever. There is now no doubt that the former views regarding the amount of fever a patient could stand for one or two weeks are responsible for the high mortality in this disease. A temperature of 103° to 105° for a dozen days is dangerous and should be combated. Among the measures that have been used with success in many instances is *quininæ sulphas*, gr. xv–xx (1–1.3 Gm.), morning and night. A strong prejudice has

arisen against quinina within the last few years, nevertheless, I know I have seen great benefit from its use, and strongly recommend it. *Cold sponging* with water alone or alcohol and water is often of great value in mild cases, and when sponging it is essential to leave the surface very wet. The *cold pack* is a very powerful antipyretic and, in cases with temperature of 104° or 105°, in which the cold bath cannot be employed, can be made use of. The bed should be protected by a rubber cloth, and the patient, with his clothing removed, should be wrapped in a sheet wrung out of cold water. The surface should be rubbed briskly through the sheet, and from time to time cold water is freely sprinkled over the sheet. Friction must be continued during the pack, and ice cloths or cap placed on the head. The duration of the cold pack is determined by the temperature and the reactive powers of the patient. It is often well to administer an alcoholic stimulant or a hypodermic injection of strychninæ sulphas before the pack and, may be, after.

The *cold bath*, after the method of Brand, or "tubbing," has proven most prompt and decided for reducing temperature. It consists in the systematic employment of general cold baths, with frictions whenever the temperature reaches 102.2° F. As often as the temperature, taken every three hours in the mouth or rectum, is over 102.2°, the patient receives a bath lasting fifteen or twenty minutes. He wears a thin muslin garment or is wrapped in a sheet; he is given a stimulant and carefully lifted into the bath of 65° or 70°, some cold water being poured over his head and shoulders to lessen the shock; the head rests on an air pillow, the body submerged to the neck. *During the whole period of the bath the patient must be briskly rubbed.* The friction and affusion are of value in preventing chill and cyanosis. After the bath the wet linen is quickly removed and the patient placed in bed wrapped in a dry sheet and covered with a blanket. A stimulant is again given after the bath, and if a tendency to cyanosis or heart failure, a hypodermic injection of strychnina. The temperature is taken after the patient is placed in bed and again in half to three-quarters of an hour, and if not then 102°, is not again taken for three hours. The good effects of the bath are seen in a reduction of temperature, clearer intellect, and lessening stupor and muscular twitching. Sleep usually follows a bath, with a general stimulating effect upon the heart and the nervous system. There are no counter-indications to the cold bath save intestinal hemorrhage.

Diarrhœa should not be checked unless it exceeds *three or four stools* in twenty-four hours, when may be used—

℞. Bismuth. subnit.,	gr. xx	1.3	Gm.	
Acid. carbol.,	♏j	.06	Cc.	
Tinct. opii deodorat.,	♏xv	1.	Cc.	
Mucil. acaciæ,	f℥j	4.	Cc.	
Aquæ,	f℥iij	12.	Cc.	M.

SIG.—Every three or four hours.

Or—

℞. Cupri sulph.,	gr. 1/6	.011	Gm.	
Extracti opii,	gr. ¼	.016	Gm.	M.

SIG.—In pill, every four hours.

At the onset of a suspected case of typhoid fever, when there are present coated tongue, fetid breath, anorexia, chilliness followed by feverishness or fever, nervousness, costiveness or frequent tenesmic stools, and general soreness associated with mental unrest and headache, excellent results follow the use of the following combination:

℞. Hydrargyri chlor. mite,	gr. viij	.52	Gm.	
Sodii bicarbonatis,	gr. xv	1.	Gm.	
Pulv. ipecacuanhæ,	gr. ij	.13	Gm.	
Salol,	gr. xv	1.	Gm.	M.

Ft. chart. No. xv.

SIG.—One powder every three hours until decided bowel action.

Or—

℞. Salol,	gr. iij	.2	Gm.	
Bismuth. salicyl., basic,	gr. v	.3	Gm.	M.

SIG.—In powder, after each stool.

Or—

℞. Acid. sulph. aromat.,	♏xv	1.	Cc.
Tinct. opii deodorat.,	♏x	.6	Cc.

SIG.—In water, every three hours.

For *Tympanites:* cold compresses or an ice-bag to the abdomen, or a turpentine stupe is of value. Page recommends the gentle introduction of a catheter far up the rectum to relieve a powerless bowel, as urine is drawn from a paralyzed bladder. Tympany with constipation is relieved by the use of *olei terebinthinæ*, ♏x

(0.6 Cc.), *olei ricini*, ♏xv (1 Cc.), in emulsion every three or four hours.

For *Thirst:* cooling drinks in moderation, or pellets of ice slowly dissolved in the mouth, and washing mouth, lips, and tongue frequently with cold water is acceptable.

Headache: cold to the head, mustard to the neck, and foot baths; if these fail to relieve, *morphina* or *atropina* hypodermically, and rarely leeches to the temples may be needed.

Delirium: if from debility, increase the stimulants; other causes, use *morphina* if the delirium is active.

Insomnia: if of long duration, use *trional*, gr. xv–xxx (1–2 Gm.).

Restlessness and *coma vigil: stimulants* and an *ice cap*.

Debility: food every *two* or *three* hours; do not permit sleep to interfere with nourishment. *Stimulants* are indicated early, the best guide being the heart's action; an average amount would be *spiritus frumenti*, f℥ss (15 Cc.) every three hours, but the amount and frequency of the dose must be guided by the condition of the heart, pulse, and general prostration. *Spiritus ammoniæ aromaticus*, f℥j (4 Cc.) every couple of hours in milk or water, is a valuable stimulant and stomachic tonic. *Spiritus chloroformi*, ♏ij–v (0.12–0.3 Cc.) every hour or two, is also a valuable stimulant.

The bladder should be examined at each visit.

Intestinal hemorrhage: at once *morphina*, hypodermically, and *ext. ergotæ fld.*, f℥j (4 Cc.), repeated p. r. n., or *Monsel's solution*, ♏v–x (0.3–0.6 Cc.) every two hours, or *olei terebinthinæ*, ♏x (0.6 Cc.), and cold to the abdomen.

Perforation and *peritonitis:* at once *morphina sulphas*, gr. ½ (0.032 Gm.), hypodermically, followed by *extractum opii*, gr. j (0.065 Gm.) every hour, hot applications to the abdomen, and bold stimulation.

Lobar pneumonia and *bronchial catarrh:* dry cups and the use of the following:

℞. Ammonii chlorid., ...	℥ij	8.	Gm.
Strychninæ sulph., ...	gr. ⅓	.02	Gm.
Spts. chloroformi, ...	f℥j	4.	Cc.
Aq. lauro-cerasi, . . . q. s. ad	f℥iv	120.	Cc.

Sig.—Dessertspoonful every two, three, or four hours, diluted.

In cases in which the tongue is dry, brown, and with a tendency

to fissure, excellent results are obtained from turpentine in emulsion:

℞. Olei terebinthinæ, ...	f℥ss	15. Cc.	
Mucil. acaciæ, ...	q. s.	q. s.	
Ol. sassafras, ...	♏xv	1. Cc.	
Aq. chloroformi, . . . q. s. ad	f℥iv	120. Cc.	M.

One teaspoonful every two or three hours, diluted.

In patients with whom the above disagrees, good results are obtained from *acidum hydrochloricum dilutum* or one of the other of the mineral acids, in doses of ♏xv (0.9 Cc.), well diluted every three or four hours.

During the entire course of the disease use *strychninæ sulphas*, gr. $\frac{1}{32}$ (0.002 Gm.), every four hours.

Convalescence: The patient must be most guarded in exercise or mental occupation. Liquid diet for ten days to two weeks after normal afternoon temperature. Cardiac palpitation and excessive sweating are not infrequent, and can be controlled by a combination of *quinina* and *belladonna*. If the stools continue quite liquid with a little bright blood now and then, showing some remaining ulceration, use *argentum nitras* in pill form with *nucis vomicæ* or *strychnina*. The addition of extract of malt or porter to the diet is of value in a prolonged convalescence.

TYPHUS FEVER.

Synonyms. Contagious fever; ship fever; jail fever; exanthematic typhus (German); petechial typhus; spotted or putrid fever.

Definition. An acute, infectious, febrile, *epidemic* disease; highly *contagious*, and characterized by sudden invasion, profound depression of the vital powers, sickening odor, and a peculiar maculated and petechial eruption, favorable cases terminating by *crisis* about the fourteenth day. No lesion.

Cause. A special infecting germ, the character of which is unknown, but which is influenced by filth and overcrowding. Rarely seen in the United States except in seaports, where brought by emigrants.

Pathology. No constant lesion peculiar to the affection. Blood is profoundly altered, dark, thin, with lessened fibrin; tissues dark, soft, and flabby.

Symptoms. Begins abruptly; *chill* followed by violent *fever*, temperature within a few days reaching 104° to 105° F.; a frequent, bounding *pulse*, soon becoming small, weak, and rapid; the cardiac impulse and first sound almost effaced, severe *headache*, followed by violent *delirium;* from the *fifth* to the *seventh* day, a coarse, red, diffused, measly *eruption*, with a mottling of the skin all over the body, except the face, not disappearing on pressure; the face has a uniform *deep, dusky flush*, the skin has a *glazed* appearance, the pupils are contracted, the eyes injected. With the development of the disease there is *cutaneous hyperæsthesia*, muscular soreness, and *tenderness* over the *tibia*. There is great *prostration*, great muscular feebleness, *vertigo, tremor*, and *subsultus; constipation* the rule. End of the second week, the temperature suddenly declines and the patient passes into a *rapid convalescence*.

Complications. Pneumonia and swollen parotid glands are common.

Diagnosis. *From typhoid fever*, the age, season, onset of the disease, temperature record, character of the eruption, and the intestinal symptoms.

Measles begin milder, with coryza and cough, and never have such pronounced nervous phenomena, but there occurs an early eruption, appearing on the face.

Cerebro-spinal fever has many symptoms in common, and but for the rarity of typhus in this country would be more puzzling. The headache and rigidity of the muscles of the neck are much more pronounced in cerebro-spinal fever and the prostration less than in typhus fever. The eruption of typhus is characteristic and should prevent error.

Prognosis. *Unfavorable indications:* high temperature, frequent pulse, early stupor, presentiment of death. *Favorable:* youth, moderate temperature and pulse, and mild nervous phenomena.

The *duration* about two weeks; *mortality* varies from five to thirty-five per cent.

Treatment. Symptomatic. As *typhus fever* is distinctly contagious, *isolation* is imperative, with immediate removal and *disinfection* of the patient's excreta.

All cases are benefited by small doses of the *mineral acids* alternating with *quininæ sulphas*.

For *high temperature*, cold sponging, cold pack, or full doses of

quininæ sulphas. Also the systematic use of the cold bath or "tubbing," as now employed in typhoid fever.

For the *headache* and *delirium* cold to the head. In the young and strong, a few leeches to the temple, and *chloral*, with or without the *bromides*.

For *constipation*, mild laxatives.

Debility : alcohol early and in full doses, or *spiritus chloroformi* in drachm doses whenever danger of collapse.

Convalescence : such tonics as *quinina* and *strychnina*.

CEREBRO-SPINAL FEVER.

Synonyms. Epidemic cerebro-spinal meningitis ; epidemic cerebro-spinal fever ; spotted fever ; cerebro-spinal typhus.

Definition. A malignant *epidemic* fever, characterized by headache, vomiting, painful contractions of the muscles of the back of the neck, retraction of the head, hyperæsthesia, disorders of the special senses, delirium, stupor, coma, and frequently an eruption of petechiæ or purpuric spots—a subcutaneous extravasation of blood. Lesions of cerebral and spinal membranes are found at the *post-mortem*.

Cause. A special micro-organism, of oval shape, occurring mostly in pairs and faintly tremulous, resembling those found in pneumonia and erysipelas, though hardly identical. Bad hygiene seems to favor the development of this affection, but can hardly be considered its cause.

The disease seems to have a predilection for the young. Occurs most frequently in the winter months. Slightly if at all *contagious*.

We have no positive knowledge of the manner in which the virus gains entrance into the system.

Pathological Anatomy. The extent of lesion present in a given case depends upon the duration of the illness. In cases rapidly fatal it is probable that the individual is overwhelmed by the poison ere the characteristic anatomical changes have had time to develop.

The changes in this disease are twofold : those due to the direct action of the infecting poison upon the blood, producing the group of symptoms constituting the fever and complications, and those giving rise to the local inflammation—viz., *hyperæmia* of the membranes of

the brain and spinal cord, followed by an *exudation of lymph* and an *effusion of serum*, resulting in pressure upon the brain and cord. The inflammatory changes are more marked in the membranes at the base of the brain than elsewhere. The lungs, spleen, stomach, liver, kidneys, and bladder are in various stages of congestion.

If the patient survive long enough, inflammatory changes occur in the cranial and special nerves and the organs of special sense.

Symptoms. Divided, according to the severity of the lesion, into three groups: the *common* form, the *fulminant*, and the *abortive*.

The Common Form begins abruptly with a *chill*, excruciating *headache*, persistent *nausea*, *vomiting*, *vertigo*, and an overwhelming sense of *weakness*. Within a few hours the muscles of the back of the neck become *rigid* and *retracted* (tonic spasm), with decided *pain* upon moving the head; this rigidity and retraction soon extends to the back, when *opisthotonus* occurs. There is great restlessness, and the surface of the body becomes highly sensitive (*hyperæsthesia*). Cramps in the muscles of the legs and elsewhere, and spasmodic twitchings of the lips and eyelids come and go, and, finally, *convulsions* or *delirium* occur. Intolerance of light, and in some cases *amaurosis*, more or less *deafness*, loss of sense of *smell* and *taste* soon following. The *temperature* and *pulse* records are irregular. From the *first* day to the *fifth* an *eruption* of petechiæ or purpura occurs in the majority of cases, and also an herpetic eruption, beginning as herpes labialis, appears. The *tâche cérébrale* is usually to be obtained. The disease reaches its height in from three to eight days, and passes into *stupor* and *coma*, or ameliorates and passes into a protracted convalescence.

The Fulminant Form. Severe *chill*, *depression*, and in a few hours *collapse*. The patient is overcome by the poison and never reacts.

The Abortive Form consists of one or more pronounced characteristic symptoms during the course of an epidemic.

Complications. Pneumonitis; endocarditis; pericarditis; typhoid fever; pleuritis; intestinal catarrh in infants.

Sequelæ. Result from thickening of either the cerebral or spinal membranes. Persistent *headache; blindness*, or *deafness*, partial or complete; mental feebleness; chronic hydrocephalus; *epilepsy*, or different forms of *spinal palsies*.

Diagnosis. *Typhoid fever* begins slowly, has a characteristic temperature record, *without so intense* headache, and muscular

rigidity, opisthotonus, vomiting, and early delirium, not ending in coma.

Typhus fever has higher temperature, is of longer duration, and has a peculiar measly eruption, is *not* attended with muscular rigidity and retraction, hyperæsthesia, nor disorders of the special senses.

Tubercular meningitis is *not* epidemic, has no characteristic eruption; is preceded by long prodromes, and runs a tedious course.

A congestive chill resembles the *fulminant* cases in suddenness of depression, but the latter has not the history of the former.

Inflammation of the meninges of the cord is due to exposure to cold or syphilis, and is not attended with cerebral symptoms or an eruption.

Small-pox in the first days, with the severe lumbar pains, headache, vomiting, and rash, may cause error.

Prognosis. Varies according to epidemic; from twenty to fifty, and even seventy-five per cent. die.

Treatment. There is no abortive plan of treatment for cerebro-spinal fever, nor can the antiphlogistic treatment for the inflammatory symptoms be advised. Like the infectious diseases in general, sustaining measures are indicated in all but the most sthenic cases.

Nutritious and easily assimilated food, such as milk, eggs, meat-juice, and broths, should be given at regular intervals night and day. If food cannot be taken by the mouth, nutritious enemata should be substituted.

The drug that holds the highest place in the treatment of this disease is *opium*. The hypodermic use of *morphinæ sulphas*, gr. ¼–½ (0.016–0.032 Gm.) every two or three hours, or *extractum opii*, gr. j (0.065 Gm.) every hour until the stage of effusion, when *quininæ sulphas* in tonic doses, and *potassii iodidum* are indicated. Prof. Da Costa alternates *potassii bromidum* with *opium*, especially in children. *Ergota* in the early stages would seem to be indicated, but in practice it is of little or no value. For the convulsions or spasms that are so often present no remedy is comparable with *chloral*, gr. xxx (2 Gm.), repeated as indicated.

Caution in the use of the coal-tar products must be exercised, as the relief of pain and spasm may be the onset of the stage of collapse instead of the beneficial effects of these drugs.

Locally, cold compresses to the head and spine is a most valuable measure, continued for hours at a time.

For *sequelæ*, *potassii iodidum*, a course of *hydrargyrum*, *oleum morrhuæ*, and flying blisters along the spinal column, or touching the back of the neck with the Paquelin cautery.

RELAPSING FEVER.

Synonyms. Febris recurrens; famine fever; bilious typhoid fever; spirillum fever.

Definition. An acute infectious, *contagious*, epidemic, febrile disease, self limited, characterized by a febrile paroxysm, lasting about six days, succeeded by an entire intermission of the same duration, which is in turn followed by a *relapse* similar to the first seizure. Associated with alterations in the viscera, and by the presence in the blood of a specific micro-organism—the spirillum of Obermeyer. No specific lesion.

Cause. A specific poison; *contagious;* acquiring the greater activity the more filthy, crowded, and unhealthy the population amid which it prevails.

Pathological Anatomy. During the febrile paroxysm *only*, the blood contains minute corkscrew-shaped organisms or *spiral* filaments,—*spirilli*, constantly twisting and rotating,—the *spirillum Obermeieri*. The spleen is enlarged and usually covered with a fresh fibrinous exudation. The capsules present a mottled appearance. The splenic pulp is more or less softened and swollen and shows enlarged Malpighian bodies. The liver and kidneys are swollen and congested.

Symptoms. No *prodromes*. Onset abrupt, with fever, 102°–104°; frequent, rather *weak pulse*, *headache*, nausea, *vomiting*, and lancinating *pains* in limbs and muscles, marked in the calf of the leg; *second day*, feeling of *fullness* and *pressure* in right and left hypochondrium, due to swollen liver and spleen; *jaundice* is frequent; *seventh day* fever ends by *crisis; fourteenth day* symptoms return in milder form, continuing about four days, when enters slow convalescence, much emaciated. *No eruption*. Several *relapses* may occur.

Diagnosis. *Yellow fever* has many points of resemblance, but has a shorter febrile stage, remission not so complete, vomiting late and characteristic, normal spleen, and the late appearance of yellow color.

Remittent fever begins with a decided chill, followed by fever and sweats, and not the progressive rise of temperature until the fifth or seventh day.

Prognosis. Recovery the rule, but protracted, and decided *emaciation* results.

Treatment. *Expectant.* Act on the secretions; nourish patient and meet urgent symptoms. For fever, antipyretic doses of *quininæ sulphas* which, however, has no power to prevent the relapses; for pain, hypodermic injections of *morphinæ sulphas;* for nausea and vomiting, *acidum carbolicum* or *cerii oxalas;* during remission, *ferrum* and *quininæ sulphas* in tonic doses.

PERIODICAL FEVERS.

These affections are characterized by the distinct periodicity of the phenomena, having intervals during which the patient is wholly or nearly *free from fever.*

INTERMITTENT FEVER.

Synonyms. Ague; chills and fever; malarial fever; swamp fever.

Definition. A *paroxysmal* fever, the phenomena observing a regular succession; characterized by a cold, a hot, and a sweating stage, followed by an interval of complete *intermission* or apyrexia, varying in length according to the variety of the attack, and the presence in the blood of a protozoön, known as the *plasmodium malariæ.*

Cause. The presence in the blood of a specific vegetable micro-organism. Klebs and Tommasi-Crudeli claim to have isolated a germ — *Bacillus malariæ* — from the low-lying atmosphere over marshes and from the soil, which produced a malarial paroxysm with enlarged spleen in an inoculated rabbit.

Laveran discovered a germ in the human blood of patients suffering from malarial fevers which is now known as the *hæmatozoa* of Laveran, and which has since been found always present in malarial attacks. These germs are true parasites and exhibit several varieties of form and size, and it is possible that there may be several species

which are capable of causing the distinct types of the disease, as tertian, quartan, intermittent, or remittent.

Laveran describes the chief forms of the hæmatozoa as consisting of *amœboid spherical bodies with nuclei; crescentic shapes with nuclei; rosettes;* and *flagellate bodies.* Laveran considers the parasites as a single but polymorphic organism, and a particular form of the germ is peculiar to a particular type of the disease. Osler, who has devoted much time to the study of the subject, "believes that different forms of the germ belong to distinct species, and that they are not all different stages in the development of one microbe."

The period of incubation varies from a few days to weeks, months, or even years, an auxiliary condition, such as exposure to cold, overexertion, excesses in eating and drinking, or great excitement, often being necessary to give efficiency to the special cause.

Either sex and all ages are susceptible to the poison.

The mode of infection is not positively understood. It often enters the system in the inspired air, and no doubt also in contaminated drinking-water or other fluids.

Pathological Anatomy. Blood dark, from the formation of pigment (*Melanæmia*). Spleen engorged and swollen (*Ague cake*). Liver swollen and engorged during paroxysm.

Varieties. *Quotidian* when a daily paroxysm; *tertian* when every other day; *quartan* when it occurs first and fourth days; *octan* when weekly; *duplicated quotidian* when *two* paroxysms daily; *duplicated tertian*, two every second day; *double tertian*, daily paroxysm, but more severe every second day. *Dumb ague*, or masked ague, presents irregularity of the characteristic phenomena.

Symptoms. Each paroxysm has three stages—the *cold*, *hot*, and *sweating*.

Cold stage begins with *prodromes*, lassitude, yawning, headache, and nausea, followed by a *chill;* the teeth chatter, skin pale, nails and lips blue, the surface rough and pale, the so-called *goose-skin*, or *cutis anserina*, nausea, and great thirst, while the thermometer in the axilla or mouth shows a decided *rise of temperature*, 102°–104° F.; these phenomena continuing from one half to an hour.

Hot stage begins gradually, the shivering ceases, the surface becomes *hot* and flushed, the temperature rising to 106° F. or more, *pulse full, headache, nausea, intense thirst, dry*, flushed, swollen skin,

scanty urine, and other phenomena of *pyrexia*, continuing from one to eight or ten hours.

Sweating stage begins gradually, first appearing on the *forehead*, then spreading over the entire surface; the *fever lessens*, the temperature rapidly falling to 99° or 98°, pulse less full, headache lessens, and a general feeling of comfort exists, sleep often following; duration of the sweating from one to four hours, when the *intermission* occurs, the patient apparently well, except for a feeling of general debility.

The occurrence of the next paroxysm depends upon the variety of the attack.

The paroxysm may be ushered in by a decided pain in one or more nerves, instead of the cold stage, to wit: "*brow ague.*"

Diagnosis. No difficulty when the characteristic *chill*, *fever*, and *sweats* occur and enlarged spleen, and the presence of the organism in the blood.

Hectic fever. Distinguished by its irregularity, and occurring secondary to an organic disease; spleen usually normal size, and absence of the organism in the blood.

Pyæmia produced by other causes than malaria.

Nervous chills show an *absence* of the temperature rise.

Prognosis. Recovery the rule. Without treatment many cases end favorably after several paroxysms, others passing into the *chronic* form, or *malarial cachexiæ*.

Treatment. *Cold stage* can be averted and the other stages greatly modified by a hypodermic injection of either *morphinæ sulphas*, gr. ⅛–¼ (0.008–0.016 Gm.), or *pilocarpinæ hydrochloras*, gr. ⅛ (0.008 Gm.), or *chloroformi spts.*, fʒj (4 Cc.), by the stomach. *Hot stage*, cool drinks and cold sponging. *Sweating stage:* when excessive, sponging with *alumen* and hot water.

Intermission: at once a brisk purgative, followed by *cinchona* in some form, the most efficient being *quininæ sulphas*, gr. xvj–xxiv (1–1.6 Gm), in solution or freshly made pills, in one or two doses, *three* to *five hours before* the expected paroxysm. Many substitutes are lauded to replace the salts of cinchona bark, but without a doubt quinina is a specific in the strictest sense of the term.

Free action on the bowels is essential to success, a good combination being *hydrargyri chloridi mitis*, *sodii bicarb.*, āā gr. v (0.32 Gm.), followed by an active saline.

After the *paroxysms* are broken up use *liquor potassii arsenitis*, ♏v–x (0.3–0.6 Cc.), for a long time, or *tinct. ferri chloridi*, ♏xx (1.3 Cc.), every four hours or a combination like the following:

℞. Ferri reducti,
Quininæ sulph., ... āā gr. lx 4. Gm.
Acidi arsenosi, ... gr. j .065 Gm.
Ol. pip. nigr., ... ♏xv 1. Cc. M.
Ft. pil. No. xxx.
SIG.—One pill after meals, continued for one month or longer.

Relapses being common, *quininæ sulphas* should be given on the *second* or *third* day, *fourth* to the *sixth*, *twelfth* to the *fourteenth*, and *nineteenth* to the *twenty-first* days.

If the *spleen* be *enlarged*,—and it usually is in long-continued cases or those becoming chronic (marked anæmia, gastric distress, constipation with depression of spirits associated with headache coming in paroxysms are the prominent symptoms of the cachexia),—use locally *ung. hydrargyri iodidi rubri*, and internally *ergota*, or *ergotine* (aq. ext.), hypodermically over the splenic region, and tonic doses of *quinina*, *ferrum*, and *arsenicum*.

REMITTENT FEVER.

Synonyms. Bilious fever; bilious remittent fever; marsh fever; typho-malarial fever.

Definition. A *paroxysmal* fever, with exacerbations and *remissions*, but in which the temperature is constantly above the normal; characterized by a moderate cold stage (which does not recur with each paroxysm); an intense hot stage, with violent headache and gastric irritability; and an almost imperceptible sweating stage, which is frequently wanting.

Cause. The presence in the blood of a specific vegetable micro-organism, either the *Bacillus malariæ* (Klebs and Tommasi Crudeli), or the *hæmatozoa* of Laveran (*vide* Intermittent Fever).

Pathological Anatomy. Blood dark (*Melanæmia*); spleen enlarged, soft, filled with blood, and of an *olive* color; liver congested and swollen, and of a *bronze* hue; the brain hyperæmic and olive-colored; gastro-intestinal canal markedly hyperæmic.

Symptoms. *Cold stage:* moderate *chill*, the temperature rising

one or two degrees, coated, dry tongue, *oppression at the epigastrium*, slight *headache*, and pains throughout the body.

Hot stage: persistent *vomiting*, furred tongue, *full pulse*, rising to 100 or 120, flushed face, *injected eye*, violent *headache*, *pains* in limbs and loins, hurried *respiration*, the *temperature* rising to 104° F., or 106°. The bowels costive, *stools tarry* and offensive, the urine scanty, high colored and ureaic, and the *surface* becoming *yellowish*. *Delirium* occurs when the temperature is very high.

Sweating stage: after six to twenty-four hours the above symptoms abate and *slight sweating* occurs, the *pulse*, *headache*, and *vomiting* subside, and the *temperature* falls to 100° F., or 99° F.

This is the *remission*, during which the symptoms of a mild pyrexia are present.

After some *two* to *eight* or *twelve* hours the symptoms of the hot stage return, generally *minus* the *chill*, and this is termed the *exacerbation*, which is in turn again followed by the *remission*.

Duration. From seven to fourteen days the average. Frequently the fever *ceases* to *remit*, and instead becomes *continuous*, the symptoms resembling, if they are not identical with, the *typhoid state*, whence the term *typho-malarial fever*, or *malario-typhoid fever*.

Sequelæ. The *malarial cachexia* results when the poison has not been eliminated from the system.

Persistent headache and vertigo are the results of the intense meningeal hyperæmia that sometimes occurs.

Diagnosis. In *intermittent fever* each paroxysm begins with a chill, while the chill seldom recurs in remittent fever; a distinct *intermission* follows each paroxysm of the intermittent form, while a *remission* occurs in remittent, the thermometer showing that the fever does not wholly disappear; during the *intermission* the patient is apparently well; such is not the case in the remission of intermittent fever.

Typhoid Fever is mistaken for remittent fever, but the *absence* of the characteristic temperature record, diarrhœa, eruption, tympanites, deafness, severe prostration, and the Widal reaction, with the presence in blood of the malarial organism, should prevent such an error, as a diagnosis can always be made with absolute certainty by an *examination of the blood*.

Prognosis. Uncomplicated cases are favorable.

Treatment. *Quininæ sulphas*, gr. xvj–xx (1–1.3 Gm.) per diem, is the remedy. Better administered during the *remission*, if possible.

If an irritable stomach prevents its administration by the mouth, use it by the *hypodermic method* or in a *suppository*. During the *hot stage*, cool sponging, cold to the head, and if a tendency to cerebral congestion, dry or wet cups to the nape of the neck and—

℞. Tinct. aconit. rad., ...	♏ij	.12 Cc.	
Liq. potassii citrat., ...	f℥ij	8. Cc.	
Liq. ammon. acetat., ...	f℥ij	8. Cc.	M.

Every two hours.

During the remission relieve the intestinal canal with—

℞. Hydrargyri chlor. mitis, ...	gr. v	.3 Gm.	
Sodii bicarb., ...	gr. v	.3 Gm.	
Pulv. ipecac., ...	gr. ss	.03 Gm.	M.

In pulv. p. r. n.

The same precautions are essential after the paroxysms are broken up to prevent their return on the septenary periods that were recommended for intermittent fever.

It is but fair to mention the statement of Koch, seconded by Hare, that quinina is a nephritic irritant, but if so, it must be in toxic amounts, which are not recommended.

For convalescence: *Ferrum*, *arsenicum*, and *strychnina* are indicated.

PERNICIOUS MALARIAL FEVER.

Synonyms. Congestive fever; malignant intermittent fever; malignant remittent fever; the congestive chill.

Definition. A malignant, destructive malarial fever, which may be of the intermittent or remittent form; characterized by *intense congestion* of one or more internal organs, *together* with dangerous perversion of the functions of innervation.

Cause. A high degree of malarial poison. (*Vide* Intermittent Fever.)

Varieties. *Gastro-enteric; thoracic; cerebral; hemorrhagic; algid.*

Symptoms. Any of these varieties may begin either as an *intermittent* or *remittent* fever; again, the *first paroxysm* is rarely pernicious, but appears as the ordinary malarial attack.

The *gastro-enteric* variety has, as distinctive features, *intense nausea* and *vomiting*, *purging* of thin discharges mixed with blood, *tenesmus*, *burning heat* in *stomach*, intense *thirst*, frequent, weak *pulse*, face, hands, and feet *cold*, with *shrunken features*, and an intense depression of all the vital forces. This condition continues from half an hour to several hours, when either an inter- or a remission occurs.

Thoracic variety often combined with the one just described. Its characteristic features are due to overwhelming congestion of the lungs, such as *violent dyspnœa*, *gasping* for air, fifty to sixty respirations per minute, *oppressed cough* with slight amount of blood-streaked sputa, *frequent*, *weak pulse*, *cold surface*, and terror-stricken features. Duration same as the above.

Cerebral variety, due to intense congestion of the brain; sometimes effusion of serum into the ventricles, or even rupture of small blood-vessels. Characterized by *violent delirium*, followed by *stupor* and *coma*, *slow*, *full pulse*, the surface either *flushed* or *livid*. Cases may either resemble *apoplexy*—comatose variety—or *acute meningitis*—delirious variety. Duration same as the other forms.

Hemorrhagic variety, or the yellow disease, as it has been termed, begins as an ordinary inter- or remittent fever, soon followed by signs of *internal congestion*, to wit: *nausea*, *vomiting*, *dyspnœa*, severe *pains* over *liver* and *kidney*, continuing for a few hours, when the *surface* suddenly turns *yellow* and *bloody urine* is voided, after which an inter- or a remission and marked abatement occur, to be sooner or later followed by a second paroxysm, which is more severe, with signs of *cerebral congestion*. Blood may also escape from other parts than the kidneys.

Algid variety is characterized by intense *coldness* of the surface, while the rectal temperature ranges from 104° to 107° F. The attack begins with a *chill*, which is soon followed by *fever* of variable duration, when the body becomes *cold*, the axillary temperature falling to 90°, 88°, or even 85° F., a *cold sweat* covers the surface, the tongue is *white*, *moist*, and *cold*, the *breath* is *icy*, the *voice* feeble and indistinct, the *pulse slow*, *feeble*, and often *absent* at the wrist, and with all these symptoms, the patient complains of a sensation of *burning* and *intense thirst*. The *mind is clear*, but the countenance is *death-like*.

Duration. Pernicious malarial fever, in any of its forms, may

continue from a few hours until one, two, or three days. Recovery is rare after a *second*, almost never after a *third*, paroxysm.

Diagnosis. A positive diagnosis can always be made by an examination of the blood.

Yellow fever is most apt to be confounded with the *hemorrhagic* variety, and as they both occur in the same localities, the diagnosis is difficult; the early *yellowness* of the surface, with *hæmaturia* and the absence of the *black vomit* and epidemic prevalence, are the chief points of distinction.

The *cerebral* variety may be mistaken for *cerebral apoplexy*, *meningitis*, and *uræmic convulsions*. Nor is it always an easy matter to differentiate between these conditions.

The *gastro-enteric* variety may be mistaken for the early stage and the *algid* variety for the later stage of *cholera*, but the epidemic prevalence of the latter should be of material aid in determining the diagnosis.

Prognosis. In all varieties the result is unfavorable, unless it can be controlled prior to the *second* paroxysm. Cases in which an *intermission* occurs are better controlled than where a remission follows. The mortality is *one* in *eight* from all plans of treatment.

Treatment. The first indication in all varieties is to bring about *reaction*. In the *cold stage*, heat to the surface, and stimulating lotions; in the *hot stage*, cold to the surface and the hypodermic injection of *morphinæ sulphas*, gr. ¼ (0.016 Gm.), at once. After *reaction*, *quininæ sulphas*, not less than gr. xl (2.6 Gm.), repeated p. r. n.; administer by stomach, rectum, or, better still, by hypodermic injection. Dr. Bartholow pronounces the following one of the best formulæ for the hypodermic use of quinina:

℞.	Quininæ disulph., ... gr. l	3.3 Gm.	
	Acid. sulph. dil., ... ♏c	6.15 Cc.	
	Aquæ font., ... f℥j	30. Cc.	
	Acid. carbol. liq., ... ♏v	.3 Cc.	M.

The new salt, *quinina bimuriatica carbamidata*, is highly recommended for hypodermic use, being very soluble.

The following formula, known as "Warburg's Tincture," has during the last few years gained considerable reputation in the various forms of malarial fevers:

℞. Rad. rhei, P. aloe soc., and Rad. angelica officinalis, . . . āā ℥iv 120. Cc.
Rad. helenii, Crocus Hipsan., Sem. fœniculi, and Creta præparat., ... āā ℥ij 60. Cc.
Rad. gentian, Rad. zedoar, P. cubeb, G. myrrh, G. camphor, and Boletus Laricis, . . . āā ℥j 30. Cc.
Confect. damocratis,* . . . . . ℥iv 120. Cc.
Quininæ sulph., ... ℥lxxxij 2460. Gm.
Spts. vini rect., ... Oxx 600. Cc.
Aquæ puræ, ... Oxij 360. Cc. M.

Macerate in a water bath twelve hours, express, and filter.

Each half ounce (15 Cc.) contains quininæ sulphas, gr. viiss (0.46 Gm.). If the stomach is too irritable to retain the tincture, the tincture may be evaporated to dryness and administered in *capsules*, each containing the equivalent of either one or two drachms.

For the *gastro-enteric* variety, Prof. Da Costa suggests :

℞. Morph. sulph., ... gr. ¼ .016 Gm.
Pulv. camph., ... gr. j .065 Gm.
Mass. hydrarg., ... gr. ij .12 Gm.
Pulv. capsici, ... gr. ss .03 Gm. M.

In pills every half hour until the character of the stool is changed.

For the *thoracic* variety, dry or wet cups and *ammonii carbonas*,

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* Formula of *Confectio damocratis :*

Cinnamon, ... 14. Gm.
Myrrh, ... 11. Gm.
White agaric, Spikenard, Ginger, Spanish saffron, Treacle, Mustard seed, Frankincense, and Chian Turpentine, ... āā 10. Gm.
Camel's hay, Costus arabacus, Zeodary, Indian leaf, Mace, French lavender, Long pepper, Seeds of harwort, Juice of rape cistus, Strained storax, Opponex, Strained galbanum, Balsam of Gilead, Oil of nutmeg, Russian castor, ... āā 8. Gm.
Water germunder, Balsam tree fruit, Cubeb, White pepper, Seeds of carrot of Crete, Poley mont, Strained bdellium, ... āā 7. Gm.
Gentian root, Celtic hard, Leaves of Dittany of Crete, Red rose, Seeds of Macedonium, Parsley, Sweet-fennel seeds, Seeds of lesser cardamon, Gum arabic, Opium, ... āā 5. Gm.
Sweet flag, Wild valerian, Anise seed, Sagapernum, ... āā 3. Gm.
Spigrul, St. John's wort, Juice of acacia, Catechu, Dried bellies of skunk, ... āā 2.5 Gm.
Clarified honey, ... 915. Gm.

The roots to be finely powdered and the whole mixed thoroughly.

spiritus ammoniæ aromaticus, *caffeina citrata*, and hypodermic injections of *strychninæ sulphas*.

For the *cerebral* variety, venesection, or cups or leeches to the neck, cold to the head, prompt purgation, and free action on the kidneys and skin.

For the *algid* variety, *warmth* to the surface, hypodermic use of *morphinæ sulphas* and *atropinæ*, and the free use of *ammonii carbonas* and *alcoholic stimulants*.

For the *hemorrhagic* variety, purgatives, *morphinæ sulphas* hypodermically, and either *acidum sulphuricum dil.*, *acidum gallic.*, *Monsel's solution*, or *terebinthina*.

The following is highly spoken of for hemorrhages:

℞. Ext. ergotæ fld.,	. . . . .	f℥ ss	15. Cc.
Acid. sulph. dil.,	. . . . .	f℥ iss	6. Cc.
Acid. gallic.,	. . . . .	℥ j	4. Gm.
Syr. zingib.,	. . . . .	f℥ iij	12. Cc.
Aquæ,	. . . . . q. s. ad	f℥ iij ad	90. Cc.

Sig.—Dessertspoonful every four hours, well diluted.

After the paroxysms are controlled, a long course of *ferrum* and *arsenicum*, with *quinina* on the septenary days.

YELLOW FEVER.

Synonyms. Yellow Jack; bilious malignant fever; typhus icterode; Mediterranean fever; sailor's fever; black vomit.

Definition. An acute, infectious, paroxysmal disease, of *three stages*—the *febrile*, the *remission*, and the *collapse;* characterized by violent fever, yellowness of the surface, and "black or coffee-ground vomit." Tendency fatal; one attack confers immunity from a second. Not contagious.

Cause. A specific poison, existing only with a high temperature and destroyed by frost. *Not due to the malarial poison.* Usually seen during the months of June, July, August, and September.

The true home of yellow fever is in the tropics.

Guiteras mentions three areas of infection: 1. The focal zone in which the disease is never absent, including Havana, Vera Cruz, Rio, and other Spanish-American ports. 2. Peri-focal zone or regions of periodic epidemics, including the ports of the tropical Atlantic in

America and Africa. 3. The zone of accidental epidemics, between the parallels of 45° north and 35° south latitude.

Epidemics are due to the introduction of the specific germ, either from patients affected with the disease or through infected articles.

Neither age, sex, race, nor social condition has immunity. One attack protects the individual.

Pathological Anatomy. *Skin* lemon or greenish-yellow color, due to dissolution of the red blood corpuscles; *heart* softened by granular degeneration; *stomach*, veins deeply engorged, the mucous membrane softened, and containing more or less "coffee-ground" matter, which consists of blood corpuscles deprived of their hæmoglobin, white corpuscles, epithelial cells, and *débris*. *Intestines* much the same as the stomach; *liver*, yellow color and a fatty degeneration of the hepatic cells; *kidneys*, granular degeneration of the epithelium of the tubules. The spleen presents a singular lack of pathological change.

Symptoms. The *incubation* lasts from twenty-four hours to six and exceptionally ten days. The more severe the epidemic, the shorter the period of incubation.

First stage, the febrile, beginning either with the prodromes of *malaise*, headache, and anorexia, or suddenly with a *chill*, high *fever*, in a few hours reaching 104° to 106° F., rapid *pulse*, 90–100 beats, *brilliant eye*, flushed countenance, coated tongue, *irritability* of the *stomach*, and severe *neuralgic pains* in the head, limbs, epigastrium, back, and large joints. The patients are restless and anxious, with a feeling of general prostration. In severe attacks *delirium* is frequent. The *urine* is scanty, acid, high colored, and contains *albumin*. A peculiar and characteristic odor is emitted from the patient. Duration of the first stage from thirty-six hours to three or four days.

Second stage, the remission, when the temperature declines to 100° or 99° F., and all the distressing symptoms abate or subside, and with some critical evacuation convalescence occurs, or, more commonly, after from a few hours to one to four days, the—

Third stage, the stage of collapse, or the period of secondary fever, is ushered in by a return of all the symptoms of the first stage in an exaggerated form, followed by *yellowness* of the skin, passing to a deep mahogany color, *black vomit*, and *hemorrhages* from other parts, *feeble pulse, cold surface, irregular respiration*, and *death* from *exhaustion*, the mind remaining clear until the end.

The above symptoms represent a *sthenic* case; other varieties are the *algid*, *hemorrhagic*, and *typhus*.

Duration. Depends upon the variety; from a few hours to a few days. Rarely continues longer than one week.

Diagnosis. *Pernicious fever*, hemorrhagic variety, is apt to be mistaken for yellow fever. Yellow fever is a disease of *one* paroxysm and *one* remission, *epidemic*, with albuminuria and black vomit. Pernicious fever has more than one paroxysm, not epidemic, rarely black vomit or albumin in urine. A valuable diagnostic point from malarial fevers is that quinine has no similar influence over yellow fever.

Prognosis. One in four perish. Short cases unfavorable, as are the hemorrhagic and algid varieties.

Treatment. *No specific:* a "self-limited" disease. The indications are to keep the patient quiet in bed, and to treat the symptoms as they arise, and to nourish the patient. Good nursing, ventilation, *early emesis* and *purgation*, with *diaphoretics* and *diuretics*, are apparently beneficial. Large doses of *quininæ sulphas*, early in the attack, for high temperature, by hypodermic method. For the irritable stomach, *ice* slowly dissolved in the mouth, and *acidum carbolicum*, gr. ¼ (0.016 Gm.), in *aqua menthæ pip.*, every two hours, alternated with *liquor calcis* and milk, each an ounce; or—

℞. Hydrargyri chlor. mite, ... gr. $\frac{1}{12}$ .005
Morphinæ sulph., ... gr. $\frac{1}{20}$ .003 M.
Every two hours until nausea is controlled.

Surgeon-General Sternberg suggests the following toward a specific action:

℞. Sodii bicarb., ... gr. cl 10. Gm.
Hydrargyri chloridi corr., . . . gr. ⅓ .02 Gm.
Aquæ destillat., ... Oij 950. Cc. M.
Sig.—Three tablespoonfuls every hour.

For the black vomit and hemorrhages, either *liquor ferri subsulphatis* or *plumbi acetas*. The pains, restlessness, or delirium are best controlled by the hypodermic use of *morphinæ sulphas* or *atropinæ*. Free stimulation from the onset is needful.

When an epidemic of yellow fever breaks out all persons whose duty does not keep them with the sick should leave the infected dis-

trict at once. "The cardinal principles involved in prophylaxis during an epidemic are summed up in the oft-quoted words, 'Isolation, disinfection, and depopulation.'"

ERUPTIVE FEVERS.

As a group, the eruptive or exanthematous fevers have many features in common. All have a period of incubation, are characterized by a fever of more or less intensity preceding the eruption, by an eruption which is peculiar to each, occurring most commonly in childhood, rarely attacking the same person twice, very prone to occasion serious sequelæ, and are contagious. Their origin is as yet undetermined.

SCARLET FEVER.

Synonym. Scarlatina, from the (old) Italian *scarlattina*, scarlatto (red).

Definition. An acute, self-limited, contagious, *infectious* disease, usually of childhood; characterized by high temperature, rapid pulse, a diffused scarlet eruption, terminating with desquamation, inflammation of the mouth and throat, and frequently more or less grave nervous phenomena. Serious sequelæ frequently follow an attack. One attack confers immunity from the disease.

Pathological Anatomy. An acute inflammation of the skin, with exudation—a true *Dermatitis*. A *granular* change in all the glandular structures, most marked in the Peyerian glands, although also occurring in the stomach and kidneys. Streptococci are usually found in abundance in the glands and areas of suppuration.

Cause. A specific poison, maintaining its vitality for a long time. Highly *contagious*, the contagion residing chiefly in the desquamated epidermis. Klebs' micrococci, the "monas scarlatinosum," may prove to be the poison. *Incubation* short, one to seven days.

Varieties. *Scarlatina simplex*, *scarlatina anginosa*, and *scarlatina maligna*.

Symptoms. A mild attack is a very trivial affection, but in its severest form there are few diseases more malignant.

Onset sudden with a decided *chill* and *vomiting* (in infants, convul-

sions), pain in the throat followed by *high fever*, soon reaching 105°; a *rapid pulse*, 110 to 140, being frequent. At the end of twenty-four hours a *bright scarlet rash* appears on the neck and chest, spreading over the entire body within a few hours; the eruption is not raised, there is no intervening healthy skin, and scattered irregularly are points of a darker hue. With the appearance of the eruption occurs *burning heat of surface*, *pain in the throat*, and *difficulty in deglutition*, the throat on inspection presenting the appearance of a *catarrhal* inflammation. *Tongue* at first furred, later red, with prominent papillæ—the "strawberry tongue." There also occurs *headache*, *great restlessness*, and in severe cases *delirium*. *Diarrhœa* quite common.

On the fourth or fifth day the fever declines by *lysis*, the eruption fading, and on the sixth or eighth day *desquamation* begins, continuing for ten days, two weeks, or longer, the *convalescence* being slow, the patient *emaciated* and *pale*.

Scarlatina anginosa are cases like the above with the addition of great inflammation and swelling of the *pharynx*, *nose*, *palate*, *tonsils*, and neighboring *glands*, the swollen glands pressing upon the surrounding parts, causing *difficulty of breathing and of deglutition*. Frequently the enlarged glands suppurate, increasing the constitutional symptoms and the distress of the patient.

Scarlatina maligna are cases with decided *nervous* phenomena, to wit: *convulsions*, *delirium*, and *muscular twitching*, the *temperature* reaching 107° to 110°, the *pulse rapid, feeble*, and *irregular*, the *eruption* delayed, of a purplish color, and in *patches*.

Complications. Three conditions are always to be looked for in all cases of scarlet fever; *otitis*, affections of the *joints*, and *acute nephritis*, each adding to the gravity of the attack.

The association of *diphtheria* with scarlet fever adds to the severity of the attack. The engrafting of these two diseases on the same individual is not an infrequent occurrence.

Sequelæ. Chronic sore throat; conjunctivitis; otorrhœa; chronic diarrhœa; subacute rheumatism; chorea; endocarditis; pericarditis; pleuritis; acute Bright's disease, and cutaneous dropsy.

Diagnosis. A typical case should cause no difficulty; the high fever, rapid pulse, sore throat, and early scarlet eruption, followed by desquamation, should leave no doubt.

Measles: the above symptoms are absent, and *catarrhal* symptoms

present, the later appearance of the eruption and the difference in its character.

Small-pox : eruption on the third day in spots, changing to pustules with secondary fever.

Dengue or break-bone fever : absence of the above typical symptoms, and presence of severe *pains in the bones.*

Diphtheria : gradual invasion, great prostration, and no eruption, but the frequent complication of scarlatina and diphtheria must be remembered.

Meningitis may be suspected from the symptoms of *scarlatina maligna ;* the epidemic influence, eruption, and rapid pulse are points of difference.

Prognosis. Depends upon the character of the attack and the association of complications. Acute nephritis, endo- and pericarditis, and pleuritis add to the gravity. The prognosis is more grave, however, from the association of diphtheria, the inflamed naso-pharynx presenting fertile soil for the ravages of that grave malady. Never can be positive of the result. Mortality ranges from ten to twenty-five per cent.

Treatment. As with other eruptive fevers, so with scarlatina, there are no specific remedies by means of which it can be arrested or controlled. Symptomatic treatment judiciously applied, however, may afford relief and diminish the fatality.

The indications are for rest in bed, good ventilation, isolation, disinfection, cooling drinks, action upon the skin, and light nourishment.

For a case of scarlatina simplex small doses of *hydrargyri chloridi mite, sodii bicarbonatis*, and *pulvis ipecac.*, every two or three hours until thorough movement of the bowels occurs, will favorably influence the fever and rapid pulse and general distress.

For cases with high *fever* and *rapidity of pulse, aconitum, digitalis, quininæ sulphas ;* or, *antifebrin*, gr. j–ij (0.065–0.13 Gm.), every couple of hours, or *phenacetin*, gr. j–ij (0.065–0.13 Gm.), every two or three hours, with cool sponging, cold bath, douche, or pack. When, however, the temperature reaches 102.5°, at once use full bath at 90° F., for eight to ten minutes, then dry child quickly, wrap in blanket and put to bed, repeating bath if temperature and nervous phenomena are marked.

If the surface be pale, the circulation feeble, and the eruption tardy in appearing, benefit will follow the administration of *tinctura digi-*

talis or *tinctura belladonnæ*, ♏j–v (0.06–0.3 Cc.), according to age, and a hot bath or pack.

With the appearance of the *eruption* anoint the entire body, save the head, with—

℞.	Eucalyptol, ...	f℥j	4. Cc.	
	Ung. petrolei, ...	℥j	30. Gm.	M.

The inunction acts beneficially in many ways. It reduces the fever by soothing the cutaneous burning and irritation; later on, when desquamation occurs, it limits the source of further infection by preventing the diffusion of the otherwise dry scales in the air; and, finally, it protects the surface from the influences of sudden changes of temperature, thus to a great extent avoiding the danger of nephritis.

For *scarlatina anginosa*, the internal use of the following combination is valuable as a blood tonic and throat astringent:

℞.	Tincturæ ferri chlor., ...	f℥ij	8. Cc.	
	Glycerini, ...	f℥j	30. Cc.	
	Aquæ, ... q. s. ad	f℥ij ad	60. Cc.	M.

Sig.—One-half to one teaspoonful every two hours, undiluted, according to the age.

Externally, ice or cold compresses, unless they cause chilliness, if so, heat. Astringent gargles and small pellets of ice dissolved in the mouth are of use. The throat and nasal cavities are kept clean and the breathing relieved by the use of Dobell's solution used with a hand atomizer every hour. The formula is:

℞.	Acid. carbolici, ...	f℥iss	6. Cc.	
	Sodii biboracis,			
	Sodii bicarb., ...	āā ℥ij	8. Gm.	
	Glycerini, ...	f℥ij	60. Cc.	
	Aquæ, ... q. s. ad	Oij ad	950. Cc.	M.

The use of this solution proves grateful to the patient, relieving the breathing through the nose by loosening the tenacious secretions. An excellent gargle for those old enough to properly use one is:

℞.	Thymol, ...	gr. iv	.26 Gm.	
	Glycerini, ...	f℥j	30. Cc.	
	Aq. dest., ...	f℥j	30. Cc.	M.

Sig.—A throat wash. If necessary, dilute further.

An excellent mouth and throat cleanser as well as gargle is *aqua hydrogenii dioxidi*, full strength or diluted.

For *scarlatina maligna*, in addition to *ferrum* and *quininæ sulphas*, the chief reliance must be on *alcoholic stimulants*, guiding the amount by their effects. In children, wine-whey, milk-punch, and egg-nog are eligible for the administration of stimulants and nourishment.

Convulsions, or only great restlessness and muscular twitchings, are the result of the high grade of fever, and call for prompt treatment. Experience in such cases is against the group of antipyretic drugs, as not meeting the indication promptly enough. The *cold wet pack* or the *cold bath* with cold affusion or the ice cap are the most efficient and rapid means of reducing the temperature and relieving the nervous disturbances.

Prof. Da Costa advocates the administration of *ammonii carbonas*, in small doses at frequent intervals, to prevent the liability of heart-clot, and for its salutary influence over the disease.

It is claimed that a characteristic micrococci is found in the blood, and that, consequently, the disease can be favorably influenced by *acidum carbolicum*, *thymol*, or *acidum boricum;* an eligible way of administering acidum carbolicum is the *syr. ammoniæ phenatis* (Déclat), f℥ss–j (2–4 Cc.), four to six times daily.

There can be no doubt but that the complications and sequelæ attending scarlet fever constitute the principal dangers of the disease.

If *diphtheria* develop, the combination of *ferrum* and *hydrargyri chloridum corrosivum* with free *alcoholic stimulation* are the indications.

Acute nephritis is so commonly associated with, or follows the decline of scarlatina that it is a prudent practice to examine the urine daily. If albumin appear, add to the *ferrum*, *tinctura cantharidis* in minute doses, and dropsy and uræmic symptoms may be prevented. If, however, true scarlatinal nephritis does develop, the following mixture of Hughes-Bennett, with saline purgatives and either a hot bath or the hot-air bath twice or oftener daily, will be followed by improvement:

℞.	Potassii acetat., ...	℥ij	8. Gm.	
	Spts. ætheris nitrosi, ...	f℥ss	15. Cc.	
	Aquæ, ... q. s. ad	f℥ij ad	60. Cc.	M.

Sig.—Teaspoonful every two hours, well diluted.

Or—

℞. Hydrargyri chlor. mite,
Pulv. scillæ,
Pulv. digital., ... āā gr. ¼–½ .016–.032 Gm. M.
Ft. pil. No. j.
Sig.—One such pill every three or four hours.

If uræmic convulsions occur, use the hot-air bath, cupping over the kidneys, hypodermic injections of *pilocarpinæ nitras*, the inhalation of *chloroformum*, or, may be, the rectal use of *chloral hydrate* with or without *potassii bromidum*. Uræmic symptoms are often remarkably controlled by full doses of *sodii benzoas*. The elimination of the poison producing the convulsions is assisted by the high bowel enema of the normal salt solution.

For *scarlatinal rheumatism* the use of *ferrum* alternately with the following:

℞. Ammonii salicyl., ... ℥ij 8. Gm.
Elix. simplicis, ... f℥ss 15. Cc.
Syr. simplicis, ... f℥j 30. Cc.
Tinct. card. co., ... f℥ss 15. Cc. M.
Sig.—Teaspoonful, diluted, four times daily.

For *inflammation of the middle ear* it is much better to puncture the drum membrane than to allow its ulceration; insufflations of *acidum boricum* and the internal use of *ammonii chloridum*.

For the various other *sequelæ* the treatment is the same as if they occurred primarily, *plus* tonics.

The disease being *contagious*, every means should be taken to prevent its spread—to wit, isolation, cleanliness, disinfection, and fumigation.

Small doses of *quinina*, in those exposed, is said to prevent or modify the severity of an attack, but no true prophylactic is known.

MEASLES.

Synonyms. Morbilli; rubeola.

Definition. An acute *epidemic* and *contagious* disease; characterized by catarrhal symptoms, referable to the naso-broncho-pulmonary mucous membrane, fever, and a crimson mottled, papular, eruption which terminates by desquamation.

Cause. A specific micro-organism, with a special susceptibility for childhood. Contagious by contact, and can be communicated by inoculation. One attack, as a rule, protects from a second. *Incubation*, ten to fourteen days.

Pathological Anatomy. There are no special anatomical characters exclusive of the eruption, which is considered among the symptoms of the disease.

Symptoms. Onset gradual, following a chill or with irregular *chills, fever*, the temperature rising to 101° or 102°, *muscular soreness, headache*, and intense *nasal, pharyngeal*, and *laryngeal catarrh*. The *eyes* are reddened and suffused and tears flow over upon the face. The throat is reddened and swollen. On the evening of the *second day* a *decided remission* takes place in the *fever*, the catarrh continuing; on the *fourth day* occurs an eruption of a *crimson* color on the face, soon spreading over the body, in the form of papules and blotches, which coalesce into irregular circles or *crescents*, with islands of white skin between, and with the appearance of the eruption the *fever returns*, the catarrh is aggravated, but the character of the *discharge*, instead of remaining clear and watery, becomes *turbid, thick*, and *yellowish*, and extends to the *bronchial* mucous membrane. About the *ninth day* (the fourth of the eruption), the eruption fades, the symptoms abate, and slight desquamation occurs. Some cough and catarrh may remain for a long period.

Black measles, sometimes called *hemorrhagic rubeola*, or camp measles, is a variety occurring in camps and jails, in which occur dangerous chest symptoms, and black spots or petechiæ from deteriorated blood, and severe prostration.

Koplik, in 1896, described a peculiar eruption found on the buccal mucous membrane (lining lips and cheeks only), consisting "of small, irregular spots of a bright red color; in the center of each spot a most minute *bluish-white speck*. These minute bluish-white specks in the center of a reddish spot are pathognomonic of beginning measles." I have almost invariably found them at the onset of the chill and catarrhal symptoms, and been able to make a diagnosis before the characteristic eruption of measles appeared. These tiny spots fade with the appearance of the mottling of the skin.

Rather common complications are *tonsillitis*, and *lobar* or *catarrhal pneumonia*.

Sequelæ. In those of *strumous diathesis*, scrofula or tuberculosis may develop.

Diagnosis. A typical case begins gradually, with chilliness, nasal catarrh, watery eye, and fever, which decline before the eruption, rising afterward; the eruption is crescentic in shape and of a crimson color, beginning on face, followed by desquamation. If experience shall determine that the eruption mentioned as occurring on the buccal mucous membrane at the onset is invariable, the diagnosis will be readily determined.

Scarlet fever: absence of catarrh, and earlier appearance and different character of the eruption, with high fever and rapid pulse.

Prognosis. As a rule, a perfect recovery. If tuberculosis develop, the prognosis is bad. Black measles, the majority succumb.

Treatment. *No specific.* Mild cases require no medicine, simply regulating the diet and bowels, and cool sponging; the indications are to render the patient as comfortable as possible, the disease pursuing a favorable course without therapeutical interference.

If the febrile reaction is high, the following soon controls it:

℞. Tinct. aconiti rad., ...	♏ss–j	.03–.06	Cc.
Spts. ætheris nitrosi, ...	♏x–xv	.6–1.	Cc.
Liquor potassii citrat., ... ad	f℥j	4.	Cc.

Every two hours.

For the *pruritus* of the *eruption*, the local use of *oils* and *fats*, particularly of *eucalyptol*, f℥ss–j (2–4 Cc.), *ung. petrolei*, ℥j (30 Gm.). For *catarrhal symptoms*, inunction of the nose, neck, and chest with *camphorated oil* and small doses of *pulv. ipecac. et opii* at bedtime; if the catarrh extends to the bronchial mucous membrane, *expectorants*.

During convalescence, for the strumous, protect from exposure, and administer *oleum morrhuæ* with *syr. ferri iodidi*. For *black measles*, bold stimulation, and *ferrum* and *quinina*.

RUBELLA.

Synonyms. Rötheln; epidemic roseola; German measles; French measles; false measles.

Definition. An acute, self-limited, contagious disease; charac-

terized by mild fever, suffused eyes, cough and sore throat, enlargement of the lymphatic glands of the neck, and a rose-colored eruption, in patches of irregular size and shape, appearing on the first day.

Many so-called second attacks of measles and scarlet fever are attacks of rubella (Tyson).

Cause. Propagated by contagion. That a peculiar germ exists is probable, but thus far it has not been isolated. *Incubation* from one to three weeks.

Rubella bears the same relation to measles that chicken-pox does to small-pox (Tyson).

Symptoms. Onset sudden, with *mild fever*, *suffused eyes*, with little or no coryza, *sore throat*, and *enlargement* of the *cervical glands*, not limited to those about the angle of the jaw, as in scarlatina. Any time from the *first* to the *fourth* day appear *rose-colored spots*, size of a pin-head, slightly elevated, which coalescing, form irregular shaped and sized patches, with intervening healthy skin, fading on the upper part of the body while just appearing on the lower. Symptoms all terminate within a week by *lysis*, the patient showing no ill effects from the attack.

Diagnosis. From *scarlet fever*, by absence of high fever, the rapid pulse, the color and character of the eruption, and the sequelæ.

From *measles*, by absence of intense catarrhal symptoms, the late appearance of eruption, and its crescentic shape.

Prognosis. Most favorable.

Treatment. Mild laxatives and restricted diet. If *fever* high, saline mixture. For *itching* of skin, sponging with vinegar and water, or inunction with *vaseline*.

SMALL-POX.

Synonym. Variola.

Definition. An acute epidemic and *contagious* disease; characterized by severe lumbar pains, vomiting, and an initial fever, lasting from three to four days, followed by an eruption, at first *papular*, then *vesicular*, and afterward *pustular*; the development of the pustule being accompanied by a *secondary fever*, during the presence of which grave complications are prone to occur.

Causes. A specific poison whose nature is unknown, maintaining

its contagious vitality for a long period. "There is no contagion so strong and sure as that of small-pox, and none that operates at so great a distance" (Watson). There is no period, from the initial fever to the final desquamation, when the disease is not contagious, although the stage of suppuration is the most virulent. One attack, as a rule, protects from a second. *Vaccination* has a positive protective influence from the disease, an extensive observation having fully proven that in proportion to the efficiency of vaccination is the rarity and mildness of variola. *Incubation*, fourteen to sixteen days.

Pathological Anatomy. A granular and fatty degeneration occurs in the liver, spleen, kidneys, and heart. The *pustules* are found in the larynx, trachea, bronchial tubes, and on the pleura.

Varieties. Discrete; confluent; malignant; varioloid or modified small-pox.

Symptoms. *Discrete form.* Onset sudden, with a *violent chill, vomiting*, and agonizing *pains in the back*, shooting down the limbs; *fever*, in short time rising to 103° or 104° F.; *full, strong*, and *rapid pulse*, ranging from 100 to 130; the *face red, eyes injected, intense headache*, and *sleeplessness*; *prostration* great from the very onset. *Delirium* and *convulsions* occur at times. During the *third day* the characteristic eruption makes its appearance, first on the forehead and lips, consisting of *coarse red spots*. With the appearance of the eruption all the marked symptoms of the fever abate, the patient feeling quite comfortable. On the *fifth day* of the disease the spots become *papules;* on the *sixth day*, transformed into *vesicles*, which are soon *umbilicated;* on the *eighth day* the *vesicles* change to *pustules;* on the *ninth day* the pustules are entirely purulent, and each surrounded with a broad red band—the *halo* or *areola*, the face becoming swollen and the features distorted; on the *eleventh day*, pus oozes from the pustules, and drying, forms the *scab*, or *crust*, which, on the *seventeenth* to *twenty-first day*, drops off, leaving a red, glistening depression or *pit*, soon changing into a white cicatrix. With the formation of the pustules (*eighth day*) severe *rigors* and *fever* set in, and a characteristic *odor* is emitted, all the original symptoms returning. This *secondary fever*, the fever of suppuration, is the most critical period of the disease, and is generally attended with *violent delirium*. In favorable cases the secondary fever subsides after three or four days, and *convalescence* is established.

Confluent small-pox differs from the *discrete* in the greater severity

of all the symptoms and the marked prostration of the patient, the *eruption* appearing during the *second day*, the *pustules* coalescing into large patches, causing great distortion of the features.

Malignant small pox is characterized by the greater intensity and the irregularity of the symptoms, death resulting before the characteristic eruption appears, by convulsions or coma. In these cases *hemorrhages* are frequent and petechiæ are observed.

Varioloid, or modified small-pox, is the form modified by previous vaccination, or by a former attack of small-pox. Its course is shorter and milder than the other forms, the eruption appearing a day later, and is *not attended with secondary fever*.

During some epidemics two other eruptions are observed, appearing on the second day, one *petechial*, in the form of a fine macular or spotted eruption on the abdomen and legs, "Simon's triangle"; the other an erythematous eruption on the sides and inner surface of the legs. Both disappear within forty-eight hours.

Complications. During the course of the *secondary fever* there is a great tendency to grave inflammations, such as *pleuritis*, *pneumonitis*, and *dysentery*. During *convalescence*, *boils* and *abscesses* on the skin are frequent.

Diagnosis. Cannot be confounded with any other disease if it has typical symptoms, such as chill, vomiting, pains in back and legs, high fever and pulse, all declining on *third day*, when the eruption appears, first spots, then papules, then vesicles, finally pustules, drying and forming crusts, and with the marked secondary fever.

Prognosis. Depends upon the *variety* of the attack, the *age* of the patient, and whether *vaccinated* or not. *Discrete*, mortality four per cent.; *confluent*, fifty per cent.; *malignant*, all perish. Under *five years* and over *forty years* of age, fifty per cent. die.

Treatment. If the patient is seen early, vaccination should be performed at once; it may modify the attack. In the absence of a specific, the treatment is entirely symptomatic. Rest in bed, good ventilation, the temperature kept at 65° F., avoiding draughts. For the *initial fever*, full pulse, and pains, *phenacetin*, gr. x (0.65 Gm.), or *antifebrin*, gr. v (0.32 Gm.), or *acetanilidum*, gr. v–x (0.32–0.65 Gm.), or, what is still better, as more soluble, *antipyrin*, gr. x (0.65 Gm.), repeated p. r. n., are of great service, rendering the symptoms more endurable. Depressing doses must be avoided.

For the *headache*, ice bags to the head and a mustard sinapism to the nape of the neck.

For *sleeplessness* and *restlessness* or *early delirium*, full doses of *potassii bromidum*, *chloral*, or *trional*.

For *secondary fever* the best remedy is *quinina*, gr. v (0.32 Gm.) every three hours, and for *cerebral excitement* of this period, either full doses of *potassii bromidum*, by stomach, or the following by rectum:

℞. Chloral, ...	gr. xx	1.3 Gm.
Mucil. acaciæ, ...	f℥ij	8. Cc.
Inf. digitalis, ...	ad q. s. f℥j	ad 30. Cc.

p. r. n.

The secondary fever being pyæmic in character, the depression should be anticipated by large doses of *tinctura ferri chloridi* and judicious *stimulation*, brandy in tablespoonful (15 Cc.) doses being most efficient.

From the onset, milk, eggs, animal broth, oysters, and beef-juice should be administered every *three hours*. *Ice* is always grateful and should be given freely, and if pustules appear in the mouth, ice should be held in the mouth as long as possible, and washes of *potassii chloras* or *acidum carbolicum* employed.

The disease being contagious, *isolation*, *ventilation*, *cleanliness*, and *disinfection* are imperative.

To prevent pitting, keep patient in a *dark room*, well ventilated. *Masks* of some unctuous material, thoroughly applied to exclude the air, have a beneficial effect. Success is claimed by a number of observers from the use of *collodium* applied once or twice daily. *Cold water* dressings constantly to face and hands are beneficial, besides allaying heat, pain, and swelling. *Hot water* can be used if more grateful. The water dressings should be made antiseptic with sublimate solutions, 1 : 5000 or 1 : 10,000; *Ichthyol*, five to twenty per cent. solution, painted over the pustules several times a day, is recommended to hasten the drying up, check extensive suppuration, and prevent pitting. If water dressing seem undesirable, anoint the body with *eucalyptol*, f℥j (4 Cc.), rubbed into *unguentum petrolei*, ℥j (30 Cc.), or *acid. carbolic.*, gr. x (0.65 Gm.) to an ounce (30 Cc.) of vaselin or *lanolin*.

VACCINATION.

Synonyms. Vaccinia; cow-pox.

Definition. Inoculation with the matter of *vaccinia* or cow-pox —*bovine virus*. The person *properly* vaccinated is, as a rule, protected from an attack of small-pox, and especially from a severe or fatal attack.

Vaccination should be performed at least *twice* in every individual, during *infancy* and at *puberty;* and it is safer to have it again performed if special exposure be liable or has occurred.

In practising vaccination the skin should be rapidly scraped until the true skin is reached and is ready to bleed, the lymph being then brushed over the abraded surface; or, instead, make three or four horizontal and transverse cuts, about four lines long, and rub the virus over them; a little blood, but not much bleeding, should result.

Symptoms. If the vaccination "takes," on the *third day* a *papule* appears; on the *sixth day* a *vesicle* has formed, with a central depression; on the *eighth day* a *pustule*, fully formed and distended with lymph, with a reddish areola, which becomes very wide. The areola begins to fade on the *tenth day*, the pustule begins to dry, and by the *fourteenth day* a *brown mahogany scab* or *crust* has formed, which is detached about the *twenty-third day*. The *cicatrix* is circular, depressed, radiated, and foveated, becoming, after a time, paler than the surrounding integument.

During the course of a vaccination more or less constitutional disturbance occurs, especially in children.

Eczematous and papular eruptions often develop in strumous children, for which the virus is unjustly held responsible.

VARICELLA.

Synonym. Chicken-pox.

Definition. A mild, slightly contagious, febrile affection; characterized by a moderate fever, and the appearance of a *vesicular* eruption, drying up and falling off in from three to five days.

Cause. A peculiar poison; attacking only children; occurring sporadically and as an epidemic.

Symptoms. Moderate *fever*, thirst, anorexia, and constipation,

followed by the eruption of *vesicles*, which rapidly dry, and within the week drop off, leaving a slight *pit*. *Pustules* almost never occur. Symptoms are so slight that, were it not for the vesicles, the affection would be often overlooked. The eruption appears on the *body* and *extremities*, very rarely on the forehead and in the mouth.

Prognosis. Most favorable.

Treatment. Entirely symptomatic. If vesicles on the face, efforts may be used to prevent pitting.

ERYSIPELAS.

Synonyms. Erysipelatous dermatitis; the rose; St. Anthony's fire.

Definition. An acute, specific, infectious disease; characterized by more or less severe febrile reaction, and a peculiar inflammation of the skin generally of the neck and face. This inflammation exhibits a marked tendency to spread, to induce serous infiltration and suppuration of the areolar tissue, and to affect the lymphatic vessels and glands.

Cause. A specific virus; a micrococcus, the *Streptococcus erysipelosus*. *Feebly contagious*. One attack predisposes to another. The etiology of idiopathic (medical) and traumatic (surgical) erysipelas are identical. *Incubation*, from two to seven days.

Pathological Anatomy. Erysipelas is a simple inflammation—a dermatitis. The visceral changes, if any occur, are of a septic character. Infarcts occur in the lungs, spleen, and kidneys. Septic endocarditis and pericarditis and pleuritis are found post-mortem. Acute nephritis may occur.

Symptoms. Onset sudden; a *chill*, followed by *fever*, which soon reaches 104° to 105°, *frequent pulse*, 100 to 130, coated tongue, *nausea* and *vomiting*, severe pains in the limbs, with epistaxis in adults and convulsions in children, and often *diarrhœa*. There is usually more or less pharyngitis, and even tonsillitis, causing painful deglutition.

Delirium is frequent, and in those of alcoholic habits it resembles delirium tremens.

The *eruption* soon follows the chill, beginning in *red spots*, which rapidly coalesce and spread; a sense of *heat*, *tension*, and *tingling* is caused by the *great œdema*, which presents a *tense*, *shiny* appearance,

the swelling being so great at times as to close the eyes and distort the features. In many cases *small vesicles* develop, which may coalesce, forming *blebs* of considerable size, containing a clear yellow serum. After five or six days the eruption begins to subside, the symptoms abate, the part affected remaining tender, and there occurs moderate desquamation.

During the height of the attack *albumin* appears in the urine, so that the possibility of *uræmic* symptoms must be remembered.

When extensive *infiltration into the areolar tissue* occurs, the swelling and tension become greater, and it is termed *phlegmonous erysipelas*.

When the *eruption spreads* to different portions of the body, it is termed *erysipelas ambulans*. Da Costa cites a case of migratory, wandering, or ambulans erysipelas, beginning on cheek and spreading from part to part until the entire body was affected, lasting three months and recovering.

Complications. *Thrombosis* of the cerebral capillaries or sinuses, or, as it is sometimes called, "erysipelas of the brain," is explained by the intimate anatomical connection of the facial vein with the pterygoid plexus and cavernous sinus.

Œdematous laryngitis, from extension to the larynx.

Pneumonia, pleurisy, and meningitis are frequent complications.

Diagnosis. Not difficult. The fever, early spreading eruption, with burning, swelling, tension, and tingling, and albuminous urine, distinguish it from the other *eruptive fevers* and *erythema*.

Prognosis. Usually favorable. Unfavorable if it attack drunkards; if it become gangrenous; if thrombosis of sinuses occur, or if it extend to the larynx.

The convalescence, even from the mildest attack, is slow, the patient continuing weak and anæmic for several weeks.

Treatment. Mildest cases only require a *laxative*, nourishing diet, and locally *vaseline* or *bismuth oleate*, to modify the heat and burning.

Professor Da Costa strongly urges the use of *free purgation* before the use of the remedies usually administered. Excellent results follow the use of:

℞. Hydrarg. chlor. mitis, ... gr. j .065 Gm.
Sodii bicarb., ... gr. ij .13 Gm. M.

Ft. chart.

Sig.—One every two hours until four, followed by a saline.

According to Reynolds, *aconitum* will cut short a sthenic attack. He administers ♏ss–j (0.03–0.06 Cc.) every fifteen minutes for the first two hours; then in hourly doses, until the surface is moist and the temperature lowered. The aconite can be used with the above powder. The author corroborates this plan from a personal experience. Watch the kidneys.

In severe cases, after bowel action, *tinctura ferri chlor.*, ♏x–xx (0.6–1.3 Cc.) every third hour, well diluted. Also *quininæ sulphas*, gr. ij (0.13 Gm.) every third hour. *Ext. belladonnæ*, gr. ¼ (0.016 Gm.), added, with benefit. The diet from the onset should be of the most nourishing character, and administered at regular intervals.

Professor Da Costa reports excellent results in cases with *rapid spreading* tendency, from the use of *pilocarpinæ hydrochloras*, gr. ⅙ (0.011 Gm.), hypodermically, or *ext. pilocarpi fluidum*, ♏xx–xxx (1.3–2 Cc.), every two hours. Good results are obtained in a fair number of cases from *potassii iodidum*. I have obtained good results in rapidly spreading cases from injection of 10 Cc. of the *anti-streptococcus* serum.

Cerebral symptoms, *stimulants*, *opium*, and *chloral*, with ice cap.

Extension to *throat*, *argenti nitras*, brushed over parts. If symptoms of œdema of the glottis develop, *tracheotomy* is indicated.

Locally, soothing applications are indicated—to wit: *Vaseline*, *ung. zinci oxidi*, *ol. olivæ cum glycerin*, *bismuth oleat.*, or *ungt. hydrargyrum*. Excellent results are obtained by the use of *ichthyol*, gr. xx–xxx (1.3–2 Gm.), *lanolin*, ʒj (30 Gm.), applied on gauze; if the face be the seat of disease, cover with a mask of gauze spread with the ointment.

The following solution painted over the inflamed area and beyond, every two or three hours, sometimes seems beneficial:

℞.	Acid. carbolic., ...	fʒ ss	15. Cc.
	Olei terebinthinæ, ...	fʒ j	30. Cc.
	Tinct. iodi, ...	fʒ j	30. Cc.
	Alcoholis, ...	fʒ j	30. Cc.
	Glycerini, ...	fʒ ss	15. Cc. M.

Ft. solutio.

Keeping the inflamed parts bathed with a twenty per centum solution of *glyceritum boroglycerini*, occasionally wetting the cloths with solution of *hydrogen peroxid*, is cooling, or gauze spread with *eucalyptol* ointment, fʒj (4 Cc.) to an ounce of lanolin, is soothing.

In the *phlegmonous* variety, *argenti nitras*, gr. xx (1.3 Gm.), *spts. ætheris nitrosi*, f℥ij (8 Cc.), brushed over and beyond the affected part, with the internal use of large doses of *quinina*, *ferrum*, and *stimulants*.

DENGUE.

Synonyms. Break-bone fever; neuralgic fever; dandy fever. The word *dengue* is pronounced *dangay*.

Definition. An acute, epidemic, febrile disease, consisting of two paroxysms of fever with an intermission. The first paroxysm is characterized by high fever, distressing pains in the joints and muscles, and a peculiar eruption; the second paroxysm is characterized by a milder fever, an eruption of different character, attended with intense itching, by some recurrence of the joint pains, and by debility.

Cause. Unknown; but it is evident that a peculiar condition of the atmosphere has some influence in its development. *Incubation*, from two to six days.

Symptoms. Onset sudden—*fever*, 103° to 105°, intense *headache*, *burning pains in the temples*, *backache*, severe *aching* and *swelling of the joints* and *stiffness of muscles*, nausea, vomiting, constipation, and the appearance of a *rash*, resembling scarlatina, from which the disease has been mistaken for scarlatinal rheumatism. After some hours to two or three days a distinct *intermission* of one or two days' duration obtains.

The onset of the second paroxysm is also sudden, but the symptoms are much less severe, although the patient is greatly *debilitated*; it is at this time that the characteristic eruption appears, being either *erythematous* or *rubeolous*, and attended with *intense itching*, remaining for about two days, when desquamation occurs and convalescence is established, but is prolonged by the great debility of the patient. Average duration of the disease eight days. *Relapses are common.*

Diagnosis. Most apt to be mistaken for *acute articular rheumatism*, especially during the *first paroxysm*, but the course of the disease and the epidemic influence should prevent such an error.

The eruption might mislead for *scarlet fever* or *measles*, were it not for the severe joint and muscular pains.

On the first appearance of the pandemic of La Grippe in 1889 the

similarity of the early myalgic symptoms with those of dengue was particularly noticeable.

Prognosis. Favorable.

Treatment. *No specific.* Entirely symptomatic.

At the onset, free *purgation and diaphoresis.*

For the *fever, quininæ sulphas*, gr. v (0.32 Gm.) every five hours, or *antipyrin*, gr. x–xx (0.65–1.3 Gm.), repeated p. r. n.

For the *pains, opium* or *phenacetin.*

For the *itching*, a lotion of *acidum carbolicum.*

DISEASES OF THE MOUTH.

CATARRHAL STOMATITIS.

Synonyms. Simple stomatitis ; erythematous stomatitis ; catarrh of the mouth.

Definition. An acute catarrhal inflammation of the whole or a portion of the mucous membrane of the mouth and tongue, characterized by pain, redness, swelling, and disordered secretion. Most common in infants and children. Chronic stomatitis occurs mostly in adults, the result of alcoholic or tobacco excesses.

Causes. Introduction of hot and irritating substances into the mouth ; difficult dentition ; secondary to disorders of the stomach, to measles, scarlet fever, diphtheria, and variola.

Pathological Anatomy. The buccal mucous membrane and tongue have a dark red appearance, are much swollen, the tongue often appearing as if too broad to lie between the teeth, the sides showing the impressions of the teeth ; the secretions are at first lessened, afterward increased, a turbid mucus covering the cheeks, gums, and tongue.

Symptoms. Oral catarrh begins with the ordinary signs of inflammation, *burning, smarting pain*, and *tension* in the mouth, in those old enough to describe their suffering. Very young children

refuse to nurse or allow their mouth to be touched, taking hold of the nipple, giving one or two pulls and suddenly letting go and beginning to cry, have *slight fever*, disordered stomach, are *fretful* and *sleepless, craving cooling drinks.*

The sense of taste is blunted, and there is usually an unpleasant, bitter taste in the mouth.

If the catarrh becomes *chronic*, the breath has a fetid odor and the tongue is coated in the morning, the taste is disordered, and there is generally more or less depression of spirits.

Diagnosis. If the buccal cavity be examined, the condition is readily discerned.

Prognosis. Recovery is the rule for the acute variety.

The *chronic* cases are usually due to the use of tobacco or alcohol, and are only modified by the absolute withdrawal of the exciting cause.

Treatment. The most important point in the treatment is the removal of the exciting cause, attention to the secretions and diet, and gently mopping out the mouth at frequent intervals with a soft wad of absorbent cotton and cold or iced water, *infusum coptis*, or diluted Dobell's solution (see Scarlet Fever), or the following:

℞.	Sodii boratis, ...	gr. xc	6. Gm.
	Aquæ destillat., ...	f℥iss	45. Cc.
	Mel. rosæ, ...	f℥iss	45. Cc.

In severe or aggravated cases a dilute solution, *argentum nitras*, gr. ij–v (0.13–0.32 Gm.), aquæ, f℥j (30 Cc.), should be applied.

APHTHOUS STOMATITIS.

Synonyms. Follicular stomatitis; vesicular stomatitis; croupous stomatitis.

Definition. An acute inflammation of the follicles and mucous membrane of the mouth and tongue, characterized by a *fibrinous* or *croupous exudation;* the exudation first appearing in *isolated spots* (*aphthæ discrete*), afterward *coalescing*, and forming large and irregular sized patches (*aphthæ confluens*), which rupture, leaving an ulcer, which slowly heals.

Causes. A disease principally of childhood. Difficult dentition; disorders of digestion; uncleanliness, such as neglect to rinse the

child's mouth after nursing; a symptom of measles and diseases of the buccal cavity.

Pathological Anatomy. Begins as a small, whitish papulo-vesicular elevation, semi-transparent, hard, and tender, with a distinct red zone about the base; there may be as few as six or as many as twenty; they may remain isolated (*aphthæ discrete*) or coalesce (*aphthæ confluens*); they are regarded as either a peculiar deposit or a local croupous exudation. After a day or two they rupture, leaving an irregular white or grayish ulcer, which slowly heals. The seat of the affection is the internal surface of the lips and cheeks, the gums, tongue, and roof of the mouth.

Symptoms. The condition begins with redness of the mucous membrane of the mouth, followed rapidly by the spots or vesicles on the inner surfaces of the lips, the edges of the tongue, and the cheeks; in infants the *pain* is so severe that the child refuses to nurse; in older children, *pain* from *talking*, *mastication*, and *deglutition; salivation* is marked, the saliva dribbling from the mouth. There is slight *feverishness*, *fretfulness*, and *sleeplessness*. *Digestion* is impaired, and quite commonly *diarrhœa* occurs. A *disagreeable*, *penetrating odor* escapes from the buccal cavity.

Diagnosis. Impossible to confound with any other affection if the buccal cavity is examined.

Prognosis. Always favorable.

Treatment. Removal of the exciting cause. Attention to the *dietary* and the secretions is paramount. If constipation occur, the use of a few powders of *hydrargyri chloridum mite*, containing gr. $\frac{1}{12}$ (0.005 Gm.), adding a small amount of *sodii bicarbonas* or small doses of *pepsinum*. Also small doses of *infusum coptis*, which seems to have also a specific action in all forms of stomatitis and gastritis. Protracted cases require tonic doses of *quininæ sulphas*.

Locally, good results are obtained from strong solutions of *potassii chloras*, *infusum coptis*, or touching the ulcers with *argenti nitras*.

ULCERATIVE STOMATITIS.

Synonyms. Diphtheritic stomatitis; gingivitis ulcerosa.

Definition. An acute diphtheritic inflammation of the mucous membrane of the mouth, continuing until extensive and unhealthy

ulcerations occur. It usually begins on the margin of the *lower gums*, and often extends to the lips, cheeks, or tongue.

Causes. Usually seen in children only. Most frequently in the families of the poor, the result of unfavorable hygienic surroundings, personal uncleanliness, and poor food. Often seen in those reduced by severe acute disease. Perhaps contagious, as *epidemics* are not rare. Prevails in institutions, jails, and camps, in which the sanitary conditions are defective.

Pathological Anatomy. The *gums* first appear congested, swollen, bleeding readily, and separated from the teeth ; soon a firmly adherent deposit in the form of patches appears, at first whitish, speedily becoming gray or even black, from disintegration, becoming soft and pulpy, the separated slough leaving irregular-shaped *ulcers*, with raised margins, from œdema of the surrounding tissue. They are not deep, and their surface is covered with a pulpy, yellowish substance. The morbid process usually extends to the inner side of the lips, cheeks, and to the tongue.

Symptoms. Begins with swelling of the mucous membrane about the base of the teeth, followed with *pain* aggravated by *mastication* or *deglutition ;* food and drink must be of the blandest character. The *mouth* is *hot*, the *saliva dribbles* away, mixed with *blood* and shreds of *pulpy matter*, the *breath is fetid*, the appetite, digestion, and bowels disordered. The patient is feverish, fretful, and sleepless.

There is always enlargement and tenderness of the submaxillary glands.

The affection is often associated with *entero-colitis*.

Diagnosis. Apt to be confounded with gangrenous stomatitis, than which, however, there are less constitutional symptoms and a slower course of the malady.

Prognosis. Favorable. If promptly and properly treated, the ulcerated surface heals rapidly, although quite commonly some teeth are lost.

Treatment. The etiology of the affection must be borne in mind and remedied. Strict attention to the diet, to the secretions, and absolute cleanliness.

Internally, the prompt use of *potassii chloras*, gr. j–v (0.065–0.32 Gm.), alone or with *infusum coptis*, frequently repeated, often acts like a specific. The general health frequently calls for *quinina*, *ferrum*, and *stimulants*.

Locally, a strong solution of *potassii chloras*, or keeping the ulcer covered with *bismuth*, or frequent applications of *alumen exsiccatum* are valuable. Cases which resist these remedies should have applied the following combination, proposed by the late Dr. Dewees:

℞. Cupri sulphat., ...	gr. x	.65	Gm.
Pulv. cinchonæ opt., ...	gr. cxx	8.	Gm.
Pulv. g. arab., ...	gr. lx	4.	Gm.
Mel. commun., ...	f℥ij	8.	Cc.
Aquæ font., ...	f℥iij	90.	Cc.

Ft. sol.

SIG.—The ulceration to be touched twice daily with the point of a camel's hair pencil.

If a spreading tendency develop, the application of *argenti nitras dilutus*, or a diluted solution of *acidum nitricum*, is indicated.

THRUSH.

Synonyms. Parasitic stomatitis; muguet; sprue; white mouth.

Definition. An inflammation of the mucous membrane of the mouth, associated with or caused by the growth of a *parasitic plant*, the *oïdium albicans;* characterized by pain, disorders of digestion and of the bowels.

Causes. The development of the thrush-fungus *oïdium albicans*, is promoted by all those conditions designated as unhygienic, by debilitated conditions of the general system, and by neglect to thoroughly rinse the mouth after nursing or bottle-feeding. It is claimed that a catarrhal stomatitis is the soil upon which the fungus develops.

The age is considered a predisposing cause, seldom being seen after two years of age. In adults, only toward the last stages of cancer or consumption.

Pathological Anatomy. The mucous membrane of the mouth presents a dark red appearance in isolated patches, on which *whitish points* appear, which rapidly coalesce into large areas. They closely resemble curdled milk, from their soft consistency. These whitish points consist of epithelium and fat, in which are embedded the sporules and filaments of the fungus.

The deposit first appears about the angles of the mouth, soon

extending to all parts of the cavity, often to the pharynx and œsophagus. The mouth is usually swollen and tender, the breath often fetid.

Symptoms. *Pain*, aggravated by *nursing* or *mastication*. The lips are swollen, the *saliva* is *increased*, the *breath hot* and somewhat fetid. There is usually increased temperature. *Diarrhœa* is frequent, the stools green and sour, causing an erythema of the buttocks.

Diagnosis. The curd-like appearance of the deposit, showing the presence of the fungus upon microscopical examination, will prevent error. Should not be confounded with aphthous stomatitis, in which *ulcers*, preceded by the formation of vesicles, are perfectly distinctive.

Prognosis. Favorable, unless occurs toward the termination of exhausting diseases.

Treatment. Absolute cleanliness of the mouth is all-important.

Internally, remedies should be directed to the removal of the disorders of the gastro-intestinal tract.

Prompt relief has followed the use of *sodii hyposulphitis saturat. solut.*, ♏iij–x (0.18–0.6 Cc.), every two or three hours, and the local application of the same solution.

Locally, solutions of *sodii boras* often answer every indication, the best vehicle being *glycerinum* or *infusum coptis*, and not *mel* or *saccharum*, a good formula being:

℞. Sodii boratis, ...	gr. lx	4.	Gm.
Glycerini, ...	f℥ij	8.	Cc.
Aquæ, ...	f℥vj	24.	Cc.

Sig.—Thoroughly applied four or five times daily, and continued for a week after the disappearance of the affection.

GLOSSITIS.

Definition. An inflammation of the parenchyma of the tongue; characterized by great swelling of the organ, with difficult mastication, deglutition, and vocalization.

The affection may be either *acute* or *chronic*.

Causes. The *acute variety* is usually the result of some direct irritation to the tongue, such as direct injury, contact of boiling

liquids, the action of acrid or corrosive substances, or the sting of the tongue by an insect, such as the bee or wasp.

The *chronic variety* is generally circumscribed; it may follow the acute; be due to the sharp edges of the teeth, or the use of a tobacco pipe.

Pathological Anatomy. *Acute glossitis* begins with intense hyperæmia, redness, and swelling of the organ; the size often becomes so great that the tongue is too large for the mouth, and thus protrudes between the teeth; its surface is covered with a thick secretion, and it becomes of a pale or grayish color. The swelling may rapidly decline, or abscesses may form, which leave a more or less decided depressed cicatrix.

Chronic glossitis occurs usually along the edges of the organ, the cicatricial changes being in circumscribed hard spots. If the entire tongue is affected with chronic inflammation, the action is superficial, and has been termed "psoriasis of the mouth."

Symptoms. *Acute glossitis* begins rather abruptly with *fever*, increased *pulse*, *restlessness*, *anxiety*, *enlargement* of the *tongue*, a sensation of *heat* in the mouth, with *pain*, and *increased* flow of *saliva*. *Mastication* and *deglutition* become difficult if not impossible, the *voice muffled*, and *dyspnœa* decided. The *glands* at the angles of the jaws are *enlarged*, which, in turn, compress the vessels of the neck.

When *suppuration* supervenes, the constitutional symptoms become severe and the oral symptoms are intensified. *Death* has occurred from suffocation in severe cases.

Chronic glossitis presents *pain* as the chief symptom, aggravated by movements of the organ.

Diagnosis. The rapid course of *acute glossitis* should prevent its being mistaken for any other affection.

Chronic glossitis, if severe, might be mistaken for *cancer* of the tongue, although the slow and mild progress of the former contrasts strongly with the rapid, severe, and painful course of the latter, with its marked constitutional symptoms.

Prognosis. *Acute glossitis* usually terminates in recovery within a week, although the danger of suffocation must always be remembered.

Chronic glossitis is an incurable malady in the majority of instances.

Treatment. For *acute glossitis* prompt measures are demanded.

For the *fever* and *rapid pulse*, *tinctura aconiti*, ♏ j–iij (0.06–0.18 Cc.) every half hour or hour until its physiological effects are produced.

For the *enlargement* of the organ, either *ice* constantly applied internally and externally, at the angles of the jaw, or the persistent use of *hot water* held in the mouth and externally; if prompt relief does not follow these measures, or if the case is an aggravated one, the prompt *deep scarification* of the tongue must be resorted to.

If *abscesses* form, promptly open them and administer *quininæ sulphas*.

If *suffocation* appear imminent, *tracheotomy* must be performed.

For *chronic glossitis*, the removal of the exciting cause and the local use of *argenti nitras* to the ulcerated edges.

"For psoriasis of the tongue," the local use of *argentum* or *acidum carbolicum*.

The general health must always receive proper attention.

GANGRENOUS STOMATITIS.

Synonyms. Cancrum oris; noma; water-cancer.

Definition. An acute, rapidly progressive gangrenous ulceration of the mouth, leading to extensive sloughing and destruction of the affected tissues.

Causes. It is probable that gangrenous stomatitis is due to some parasitic micro-organism, but its character is as yet unknown. It attacks feeble and sickly children by preference; now and then observed in adults.

It is seen as a primary affection and as a sequelæ to measles, scarlet fever, typhoid and typhus fevers, and pneumonia.

Pathological Anatomy. The process is essentially a rapidly progressive moist gangrene.

Symptoms. Noma usually begins insidiously by the destructive process developing upon an ulcerative stomatitis, or the appearance of a sloughing ulcer on the gums or the inside of the cheek of an apparently healthy mucous membrane. Often the *gangrenous odor* is the first symptom noted. The cheek *swells*, becomes *œdematous*, and the skin waxy looking; within a day or two the process may spread, involving the whole side of the face, and as the ulcer becomes

deeper and approaches in its progress the integument, the skin becomes red, blue, purple, black, or a combination of these shades, followed by the development of a *bulla* filled with ichorous fluid, the skin softening and breaking down.

The constitutional reaction is very severe; *pulse rapid* and *feeble; temperature* 102°–104° F.; extreme prostration; *pain* but little complained of, but the *odor* fills the house; *diarrhœa* is common, hemorrhages from the mouth rare. Death usually occurs in a week to ten days, the patient often presenting a frightful picture. Very rarely recovery occurs.

Diagnosis. No other disease or condition can be confounded with gangrenous stomatitis.

Prognosis. Nearly all cases die.

Treatment. There is but little to say about the treatment of noma. Destruction of the ulcer by the use of *argentum nitras* in stick, fuming *acidum nitricum*, or the Paquelin cautery might be tried. Washes of antiseptic solutions, and the application of quantities of finely powdered *acidum boricum* are useful. Keep up the strength of the patient with *ferrum*, *arsenicum*, *quininæ sulphas*, and *stimulants*.

DISEASES OF THE STOMACH.

ACUTE GASTRIC CATARRH.

Synonyms. Acute simple gastritis; gastric fever; bilious fever; acute indigestion; subacute gastritis.

Definition. An acute catarrhal inflammation of the mucous membrane of the stomach; characterized by feverishness, loss of appetite, nausea, with occasional vomiting, painful digestion, irregularity of the bowels, and in severe attacks, vertigo (*stomachic vertigo*).

Causes. Deficient quantity of or quality in the gastric juice. Errors in diet, insufficient mastication of food, swallowing liquids

which are either too hot or too cold, and particularly the abuse of alcoholic liquors, cold beer, and iced soda-water. Certain drugs in medicinal doses, such as iodides, bromides, and arsenic.

Often secondary to infectious diseases, such as scarlet fever, measles, smallpox, diphtheria, and typhoid fever. Occasionally the result of wet, changeable weather.

Pathological Anatomy. The mucous membrane is irregularly congested and engorged, and covered with a grayish, semi-transparent and *tenacious mucus*, having an *alkaline* reaction. The *true gastric juice* is secreted in *lessened amount* or is *entirely suspended*.

Symptoms. At first, *loss of appetite*, at times *disgust for food*, heavily coated tongue, bad *taste* and *breath*, persistent *nausea*, and at times *vomiting*, first of undigested food, then viscid mucus, acid and bitter, and, finally, bilious matter; moderate *irritative fever* is present, with *headache*, considerable *thirst*, and flashes of heat with sensations of burning in the palms of the hands and soles of the feet; *acid drinks* eagerly sought after; *digestion imperfect*, giving rise to *pain*, *tenderness*, *feeling of weight*, and *eructations*; bowels may be loose, but are oftener constipated. *Vertigo* with *pain* in the *nucha* is a prominent symptom in many cases, causing great anxiety and depression of spirits. The *urine* is scanty, containing *lithates* and pigment.

The symptoms are aggravated by errors in diet, and if saccharine or fatty articles are taken *heartburn* occurs.

Toward the termination of an attack, *herpetic* eruptions appear about the mouth.

Diagnosis. Acute gastric catarrh with fever may be confounded with *remittent* and *typhoid fever* of the first week, but all doubts will disappear as these maladies develop.

The *vertigo* may be mistaken for *cerebral disease*, but the disappearance of this symptom when stomachic treatment is inaugurated removes all apprehension.

Prognosis. Favorable. Duration about a week; recovery slow, even under treatment, as far as perfect digestion is concerned.

Treatment. Give the stomach as complete a *rest* as possible, and as anorexia is a prominent symptom, the error should not be made of insisting upon the patient eating for a day or two at least.

If the stomach is overloaded, a rare incident, an *ipecac emetic*, or *apomorphinæ hydrochloras*, gr. ⅛ (0.008 Gm.), by hypodermic injection, is indicated, or, if vomiting has begun, it may be encouraged by

swallowing large draughts of *hot water*, which will act as a sedative if the stomach be empty.

The majority do better by an active purgation with either *hydrargyri chloridi mite*, gr. v–x (0.32–0.65 Gm.), with *sodii bicarbonas*, gr. v (0.32 Gm.), followed in six or eight hours with an ounce dose *magnesii sulphas*, or a full dose of Hunyadi Janos water; or small doses every two hours of powders containing—

℞ Hydrarg. chlor. mite, ... gr. ¼–½ .016–.032 Gm.
Sodii bicarb., ... gr. ij .13 Gm. M.

Every two hours for a dozen, followed the second morning after the last powder with a saline purgative.

After the stomach and bowels have been thoroughly cleansed, the diet may be more liberal, and some one of the following drugs used: *tinctura nucis vomicæ*, ♏v–xv (0.3–1 Cc.), well diluted, every four hours, or *pepsinum* or papoid. The following is an excellent stomachic sedative:

℞ Sodii bicarb., ... ʒiij 12. Gm.
Bismuth. subnit., ... ʒij 8. Gm.
Aq. chloroformi, ... fʒiij 90. Cc.
M. et adde
Aq. menthæ pip., ... fʒj 30. Cc.
Aq. lauro-cerasi, ... fʒij 60. Cc. M.

Sig.—Tablespoonful four times a day.

Another excellent formula after the acute symptoms have subsided is:

℞ Strychninæ sulphas, ... gr. ss .03 Gm.
Acid. hydrochlorici dil., ... fʒiv 15. Cc.
Glycerini, ... fʒj 30. Cc.
Tinct. card. comp., ... fʒss 15. Cc.
Aq. lauro-cerasi, ... fʒj 30. Cc. M.

Sig.—One teaspoonful, diluted, four times daily.

ACUTE TOXIC GASTRITIS.

Synonym. Toxic gastritis.

Definition. An acute and violent inflammation of the mucous, submucous, and muscular coats of the stomach, with loss of tissue; characterized by great pain, constant vomiting of blood-streaked

or bloody mucus, and whatever may be ingested, and symptoms of collapse.

Causes. Ingestion of irritant and corrosive poisons, such as the mineral acids, arsenic, corrosive sublimate, copper, and carbolic acid.

Pathological Anatomy. The mucous membrane is vividly red and injected, more marked at some portions than at others; it is soft and friable; erosions are irregularly scattered, and the submucous, muscular, and at times serous coats show decided destructive changes. The gastric tubules are destroyed in large numbers. In many cases the *oral* mucous membrane presents signs of severe inflammation.

Symptoms. Immediately or soon after swallowing the irritant there ensues a deadly *nausea*, with rapid and *persistent vomiting;* first, of the contents of the stomach acted upon by the poison, afterward, shreds of mucous membrane and blood clots; there are also present great *anxiety* and *depression*, a *weak*, *rapid pulse*, *slow* and *shallow respiration*, *cold skin*, covered with a *cold sweat*, *intense burning pain* and *heat* at the epigastrium, *thirst* with *burning* in the *fauces* and *gullet*, and *exhaustive purging; the features* are *more* or *less retracted* or *sunken;* these symptoms terminating in collapse and death, or slow convalescence and recovery with a crippled stomach. If death be delayed some hours, marked *nephritic* symptoms appear.

A *diagnosis* of the character of the poison swallowed is often afforded by the *stain* of the lips, face, and mucous membrane, to wit: *sulphuric acid*, blackish eschar; *nitric acid*, yellowish eschar; *caustic potash*, spreading widely and softening the tissues; *corrosive sublimate*, whitish or glazed; *carbolic acid*, white and corrugated; *chromic acid*, yellowish-white, changing to grayish brown.

Prognosis. Very grave. Many perish from shock, and the destruction of the mucous membrane of the stomach, which prevents nourishing. Early treatment when no perforation of the walls of the stomach has occurred and recovery is possible, the organ being ever after much weakened.

Treatment. *At once*, hypodermic injection of *morphinæ sulphas*, repeated as often as indicated.

Vomiting should be encouraged by the free use of *demulcents*.

If the case be seen within a short period of the swallowing of the poison, the proper antidote should be used, but if some hours have elapsed, it is useless.

IRRITANT AND CORROSIVE POISONS.

Poison.	*Antidotes.*
Acids, mineral or oxalic.	Chalk, magnesia (plaster of wall in emergency), solution carbonate soda, emollient drinks, fixed oils.
Ammonia ("household ammonia") or liniment.	Vinegar mixed with a bland oil, and sustain heart with strychnia.
Arsenic.	Moist peroxide of iron (obtained from perchloride of iron and calcined magnesia) or the ferri oxidum hydratum, U. S. P., charcoal, ammonia to nostrils.
Carbolic acid.	Castor oil, olive oil, and the sulphate of magnesium or sodium as a chemical antidote. Prompt stimulation.
Chromic acid.	Acetate of iron, ten per cent. solution nitrate silver, forming insoluble silver chromate.
Corrosive sublimate.	Albumen, white of egg (four grains sublimate require white of one egg), flour, milk.
Iodine.	Demulcent drinks, starch or flour in water.
Phosphorus (matches).	Magnesia, turpentine, demulcents. Wash stomach by use of stomach tube or pump and warm water, afterward using Epsom salts.
Silver nitrate.	Solution common salt in demulcent drinks.
Soda, or "caustic potash." "Lye."	Olive oil, demulcents, vinegar, lemon juice, and hypodermically stimulants.
Sulphate copper.	Albumen or white of egg, stomach pump, and wash stomach with soap water.

Ice, internally and externally, gives great relief. The stomach should be washed out with the stomach tube or pump, thereby removing any remaining poison, which at the same time acts as a sedative to the inflamed membrane. *Bismuthi subnitras*, gr. xx–xxx (1.3–2 Gm.) every hour or two, is beneficial.

Milk and *lime-water* is the only food that should be given by the stomach, *enemata* being used to support the system. *Strychninæ sulphas* and *atropinæ sulphas* hypodermically to sustain the heart and nervous system.

CHRONIC GASTRIC CATARRH.

Synonyms. Chronic gastritis; chronic dyspepsia; drunkards' dyspepsia.

Definition. A chronic catarrhal inflammation of the stomach, with thickening of the coats and atrophy of the gastric glands; characterized by tenderness over the epigastrium, impaired appetite, painful and imperfect digestion, thirst, and great depression of spirits or melancholia.

Van Valzah describes three forms of chronic gastritis—viz.: (1) Gastritis catarrhalis chronica, or chronic asthenic gastritis; (2) gastritis glandularis proliferans, or chronic hypersthenic gastritis; (3) gastritis glandularis atrophicans, or progressive atrophy of the gastric glands.

Causes. Repeated attacks of acute gastric catarrh; habitual and excessive use of spirituous liquors, tea, coffee, and the free use of ice-water during and between meals; improperly prepared and unsuitable food; irregularity of meals and imperfect mastication; excessive tobacco-chewing; malaria; disease of the heart, lungs, pleura, liver, or kidneys, producing chronic congestion of the stomachic vessels; cancerous or other degenerative diseases of the stomach.

Pathological Anatomy. The mucous membrane is of a brownish or slate color, elevated into ridges from hypertrophy, the result of constant congestion; the peptic glands first increase in size, then undergo granular change, atrophy of their cells resulting. The mucous membrane is covered with a thick, alkaline, tenacious mucus. Ewald describes the minute anatomy as that of a parenchymatous and interstitial inflammation, which may lead to such widespread degeneration of the glandular elements that ultimately scarcely a trace of secreting tissue remains. These changes may affect the entire organ or be limited to portions of the stomach.

Symptoms. The persistent and manifold symptoms of *indigestion*, varying somewhat with the extent of the mucous surfaces and secreting glands involved, are the first indications of the disease, such as *loss of appetite*, disagreeable feeling of *gnawing* and at times *fullness* in the stomach, *tenderness* at the epigastrium, but slightly influenced by eating, *prominence* of the epigastrium, from distention by decomposing gases, occasional *nausea* and *vomiting* after meals, of undigested food, or, when the stomach is empty, of colorless fluid. A

colorless vomit joined to symptoms of long-continued indigestion is always very characteristic of chronic gastritis. Drunkards suffer from an early morning vomit consisting of glairy mucus and saliva swallowed during sleep, raised only after great retching. The *tongue* is usually heavily coated, although it may be clean; *thirst* is often constant, water and more frequently stimulants being craved; *burning* at the pit of the stomach and under the sternum (heartburn) is very common; *pain*, sharp and diffused, after eating; the *bowels* are *constipated*, the *urine* high-colored and contains an excess of phosphates or urates, or exhibits crystals of oxalate of lime. In advanced cases the circulation is feeble, there is *depression of spirits* amounting in some instances to delusional melancholia; *sleeplessness* is persistent, and occasionally there are attacks of *vertigo* (stomachic vertigo), which greatly alarm the patient. All of these symptoms result from either a deficient secretion of the gastric juice or from a lessened proportion of hydrochloric acid in the juice secreted, and also from the excessive mucus and from diminished peristalsis of the stomach, such morbid conditions favoring the fermentation and decomposition of the food. *Follicular pharyngitis* of an aggravated type adds to the general distress of the patient. The imperfect digestion causes more or less *loss of flesh*, the fat disappearing, the muscles relaxed and the skin dry, harsh, and of a dirty-pale color, and not infrequently eczema and other cutaneous diseases develop.

Diagnosis. Chronic gastritis is associated with so many chronic diseases that a correct diagnosis is of great importance. Among the affections likely to lead to error in diagnosis are gastric ulcer, gastric cancer, gastric dilatation, cerebral vertigo, cardiac disease, and disease of the kidneys and liver.

Prognosis. Complete recovery is hardly to be expected, but great amelioration of symptoms occur and with guarded diet and mode of life good health may be enjoyed for many years. It is usually a disease of middle life.

Treatment. The first indication is the correction of the *indigestion*, which is usually the most pronounced and distressing symptom; this is accomplished by carefully regulating the amount and character of the food used, avoiding fatty, saccharine, and starchy articles or highly seasoned food or stimulants. A milk diet is beneficial, to which may be added beef in small amounts, eggs, oysters, and a few fresh green vegetables. If beef is allowed, it had better, for a time,

be in the form of "Salisbury steaks"—made of lean beef shaped into flattened cakes and *broiled*. This or whatever other articles of diet are allowed to be taken an hour or more after *sipping* slowly a half pint (237 Cc.) of water, at 110°–150°. The *hot* water should also be taken before retiring.

The second important symptoms to correct are the *constipation*, which is often most obstinate, and *clearing* the stomach of the tenacious mucus which neutralizes whatever gastric juice is secreted. Appropriate purgatives are the natural mineral waters, such as Bedford Water, Saratoga, Hunyadi Janos, or—

℞.	Magnesii sulph., ...	gr. lx–cxx	4.–8. Gm.	
	Sodii et potass. tart., ...	gr. xxx–lx	2.–4. Gm.	
	Acid. tartaric., ...	gr. xx	1.3 Gm.	M.

Dissolved in a glass of water and drank, effervescing, an hour before breakfast.

An excellent purgative and promoter of stomachic peristalsis is:

℞.	Ext. cascaræ sagradæ fld., ...	f℥j	30. Cc.	
	Glycerini, ...	f℥ss	15. Cc.	
	Tinct. nucis vomicæ, ...	f℥ss	15. Cc.	
	Aq. chloroformi vel inf. glycyrrh.,	f℥j	30. Cc.	M.

Sig.—One to two teaspoonfuls after meals, well diluted.

For the purpose of *cleansing* the stomach of the tenacious mucus as well as for its stimulating action on the glands, *lavage* or irrigation of the stomach with lukewarm water is valuable. The water can be medicated with a solution of salt, or sodii bicarbonas or acidum boricum. Ewald considers the morning, on an empty stomach, the preferable hour for the practice of stomach washing.

Those patients who object to lavage obtain relief from the systematic drinking of one-half to one pint (237–475 Cc.) of *hot* water an hour *before* meals, as mentioned above.

For the irritable condition of the mucous membrane, associated with the poor appetite and slow digestion, good results are reported from *strontii bromidum*, gr. xv (1 Gm.), well diluted, before meals.

For the morbid condition of the mucous membrane may be used, *liq. potassii arsenitis*, ♏j–ij (0.06–0.12 Cc.), *before meals*, or *bismuth. subnit.*, gr. x–xx (0.65–1.3 Gm.), on a comparatively empty stomach, one hour before or two or three hours after meals; it may at times be

combined with *sodii bicarbonas*. The following combination often gives great comfort for a long time if the diet is regulated:

℞. Sodii bicarb., ... ʒiv 15. Gm.
Bismuth. subnit., ... ʒvj 24. Gm.
Aquæ chloroformi, ... fʒiij 90. Cc.
M. et adde
Aquæ lauro-cerasi, ... fʒiij 90. Cc.
Strychninæ sulph., ... gr. j .065 Gm. M.
Sig.—Two teaspoonfuls at meal-time in a little water.

Argenti nitras, gr. ¼ (0.016 Gm.), or *argenti oxidum*, gr. ss–j (0.032–0.065 Gm.), in pill, *before meals*, or *acidum hydrochloricum dilutum*, ♏x–xv (0.6–1 Cc.), in water, before meals, are useful remedies.

Pain is so severe in some cases that resort must be had at times to *opium* or *belladonna* in small doses, after meals. *Emplastrum belladonnæ* over the stomach is useful. *Cocainæ hydrochloras*, gr. ⅙ (0.01 Gm.), is also recommended.

To aid digestion, acids, pepsinum, pancreatinum, papoid, and bitters are of value, the following being an excellent prescription:

℞. Pepsini (cryst.), ... gr. lx 4. Gm.
Acid. hydrochlorici dil., ... fʒiv 15. Cc.
Glycerini, ... fʒiv 15. Cc.
Strychninæ sulph., ... gr. ss .032 Gm.
Aquæ chloroformi, . . q. s. ad fʒiij ad 90. Cc. M.
Sig.—One teaspoonful at meal-time in a little water.

Rest of the body and mind is almost as important as rest of the stomach.

GASTRIC ULCER.

Synonyms. Peptic ulcer; chronic gastric ulcer; perforating ulcer.

Definition. A solution of continuity, involving the mucous membrane and one or more layers of which the walls of the stomach are composed; characterized by gastric pain, disorders of digestion, and vomiting of blood.

Causes. There is no generally accepted view of the etiology. Van Valzah truthfully says, "Ulcer is not a disease with a single cause and one mode of genesis." Ewald attributes it mainly to an

"altered composition of the blood, and the resulting insufficient nourishment of the cells." Riegel claims that the ulcer is due to a self-digestion of the stomach at a limited spot, and it is certainly more than a coincidence that in ulcer the gastric juice is nearly always hyperacid. More common in young females than males. Anæmia or its sequela a chief factor; disorders of menstruation; blows over the epigastrium; burns of the integument; syphilis; tuberculosis. Virchow claims that *emboli* or *thrombi* form in the nutrient gastric arteries which have lost their tonicity, an ulcer forming at the point of obstruction.

Pathological Anatomy. In the majority of cases the ulcer is solitary. The posterior wall near the pylorus is the most frequent location.

In a typical case there is a circular hole, with sharp borders in the serous coat of the stomach; the loss of substance is greater in the mucous membrane than in the muscular coat, and greater in this than in the serous coat, so that the ulcer looks like a shallow funnel, the apex at the outer wall, the base at the inner wall of the stomach; it is first round, growing, becomes elliptical, bulging at portions, becoming irregular; size, from ¼–½ inch in diameter. When the ulcer heals before all the coats are perforated, a distinct cicatrix marks the location. During its progress nutrient vessels are eroded, causing profuse hemorrhage. Chronic gastric catarrh complicates the majority of cases.

Symptoms. More or less prominent symptoms of indigestion. *Pain* constant at the "pit of the stomach," increased by taking food, especially of an irritating character, the pain often felt in the back, of a *burning*, *gnawing* character. *Tenderness* at one or more points, extending from the front to the back. *Vomiting* is almost as constant as pain, coming on soon after eating if the ulcer is at the cardiac orifice, an hour or so after if it is located at or near the pylorus. Rejected matter may be undigested or partly digested food, or simply acrid mucus. *Vomiting of blood* in large quantities and arterial in color is almost diagnostic of gastric ulcer; the blood may be dark in color if it has remained in the stomach some time before being rejected.

Severe and frequent attacks of *gastralgia* may add to the suffering of the patient. The general condition of the patient is not significant, some being greatly debilitated, while in others the nutrition is but little deranged.

Duration. The ulcer is slow in forming, and runs a very chronic course, an average duration being, perhaps, about a year. Cases are recorded in which the disease has suddenly developed and terminated by *perforation*, *peritonitis*, and *death* within two weeks, but such instances are rare.

Diagnosis. *Duodenal ulcer* presents symptoms so akin to those of gastric ulcer that a differential diagnosis is impossible.

Chronic gastritis is often confounded with gastric ulcer; the distinctive points are: absence of vomiting of blood, no localized constant pain aggravated by food, and no tenderness in the back; while the symptoms of indigestion are marked and persistent, with, as a rule, a history of spirit drinking, and the age of the patient—middle life; ulcer in the young.

The points of distinction between *gastric cancer* and *gastralgia* will be pointed out when considering those affections.

Prognosis. Gastric ulcer is a dangerous disease, and the prognosis should be very guarded. Recoveries are frequent.

The dangers are *perforation*, *peritonitis*, or *fatal hemorrhage*.

Treatment. Give the stomach as complete a rest as possible; this is accomplished by *rectal* alimentation, or when it cannot be carried out, an exclusive *milk* diet, adding *lime-water* to enable the stomach to better retain the milk, or a strictly skimmed-milk diet, to which may also be added lime-water; the amount of milk should be one or two ounces every two hours. *Rest in bed* and keeping the stomach empty by rectal feeding give the most favorable condition for the healing of the ulcer. If a severe hemorrhage occurs and collapse is imminent, a pint (475 Cc.) of warm physiological solution of common salt (℥j or 4 Gm.) to one pint (475 Cc.) should be slowly introduced into the rectum. Additional amounts of the salt solution may be injected into the subcutaneous cellular tissues. At the same time sustain the heart by hypodermic injections of *strychninæ sulphas*, *nitroglycerinum*, and *ammonia*.

To correct *hyperacidity* use a combination of *sodii bicarbonas* and *magnesia calcined*, in large doses after each feeding, if stomach alimentation is allowed, and, if not, every four hours. *Belladonna* is a valuable drug for excessive acid secretion.

For *pain*, small doses of *morphinæ sulphas* should be used as needed.

For *hemorrhage*, hypodermic injections of *ergota* are most reliable.

Plumbi acetas, gr. j–iij (0.065–0.2 Gm.), arrests the bleeding and exercises a favorable influence over the ulcer. An ice-cap or bag over the epigastrium is most valuable.

For the *ulcer*, *liquor potassii arsenitis*, ♏j–ij (0.06–0.13 Cc.), every five hours, has given excellent results in several cases treated by the author; *bismuthi subnitras*, gr. xx–xxx (1.3–2 Gm.), combined with *sodii bicarbonas*, gr. v (0.32 Gm.), three times a day, often does well; *argenti nitras*, gr. ¼–⅓ (0.016–0.022 Gm.), every four hours, or *argenti oxidum*, gr. ss (0.032 Gm.), every four hours, are at times beneficial.

For the associated anæmia, *ferrum* and *arsenicum*, alone or combined, are indicated. Ferri albuminate would seem to be particularly indicated, or the following:

℞. Pulv. ferri albuminatis, ... gr. ij .13 Gm.
Sodii arseniat., ... gr. $\frac{1}{20}$ .003 Gm. M.
Ft. pil. or capsule, taken three or four times daily.

The bowels must be kept soluble.

If *perforation* and *peritonitis* result, full doses of *opium* are indicated. Surgical aid is indicated for the perforation.

GASTRIC CANCER.

Synonyms. Cancer of the stomach; gastric carcinoma.

Definition. A peculiar malignant growth, occurring for the most part at the pyloric extremity of the stomach, making constant progress, destroying the gastric tissues and infecting the lymphatic glands; characterized by disorders of digestion, pain, vomiting, marked anæmia, and terminating in all cases by the death of the patient.

Cause. Hereditary. Develops after forty years, for the most part. The question of a cancer germ is gaining ground. Twice as many cancers occur in women as in men.

Pathological Anatomy. Cancer of the stomach is the most common form of cancer. It is, as a rule, a primary cancer. The variety is most commonly the *scirrhus*, next in frequency, *medullary*, the least frequent, *colloid*. As regards the location, eighty per cent.

occur at the *pylorus*. Those portions of the stomach remote from the cancer are normal or comparatively healthy.

It originates usually in the *tubules*, rapidly infiltrating the remaining tissues, thickening everywhere as it progresses, and either remains a hard nodulated mass or undergoes ulceration. The hard nodulated growth at the pylorus constricts the orifice, resulting in dilatation of the stomach. The lymphatic glands adjacent to the stomach are infiltrated, secondary cancers resulting. Ulceration into an artery causes hemorrhage into the peritoneum, resulting in local peritonitis.

Complications. Fatty heart; thrombosis; tuberculosis.

Symptoms. The development of gastric cancer is insidious, with *indigestion*, progressive in character, associated with *marked acidity*, *flatulency*, and a fetid breath.

The majority of cases have *vomiting*, occurring immediately after eating, if the disease is at the cardiac orifice, and some hours after if located at the pylorus; if much dilatation of the stomach develop, the vomiting occurs some days after eating. The rejected matter is food in various stages of digestion, associated frequently with *black grumous masses* of altered blood and tissues. *Hematemesis* is frequent, rarely profuse, usually oozing of blood altered into a dark brown or black color—"coffee-ground" vomit or the oozing blood passes into the intestinal canal, causing tary stools.

Absence of hydrochloric acid in the stomach is a very constant observation in gastric cancer. Boas and Stewart (D. D.), in 1895, found, by the use of the test-meal (flour soup), that *lactic acid* was always present in gastric cancer, and they were unable to find this acid in any other stomach condition.

Pain, marked and constant, *dull*, *heavy*, increased by pressure or food, seldom lancinating. Marked *anæmia* and *emaciation* soon occur, the surface having an earthy or *fawn color*. *Œdema of the ankles* is an early diagnostic symptom in carcinoma of the stomach, often occurring as early as the third month, and may progress to a general anasarca. A *tumor* is found in three-fourths of the cases, occupying the epigastric region, *not moving with inspiration*. As the carcinoma progresses, the lymphatic glands enlarge, particularly the supra-clavicular and inguinal glands. Jaundice frequently occurs, and the liver is enlarged. The urine often contains albumin. An irregular temperature occurs in some patients.

The duration of the disease is about one year, the patient dying

from *exhaustion*, *peritonitis*, or *hemorrhage*, the mind clear but despondent.

Diagnosis. The continuous absence of free hydrochloric acid and the presence of lactic acid in the stomach are diagnostic signs of great value in determining the probable existence of gastric cancer. It is possible to make a positive diagnosis by study of the rational symptoms and the aid of the X-rays.

Chronic gastric catarrh differs from gastric cancer in the absence of a tumor, bloody vomit, characteristic pain, peculiar color of the surface, dropsy, and the rapid emaciation.

Gastric ulcer differs in the character of the pain, age of the patient, large amount and color of bloody vomit, the absence of a tumor, and progressive emaciation. Still the diagnosis is often difficult.

Abdominal tumors may raise the question of a gastric cancerous tumor; the points of distinction are the characteristic symptoms of gastric cancer, and that abdominal tumors, especially of the liver and spleen, the ones most apt to cause error in diagnosis, are influenced by inspiration, while *tumors of the stomach are not* so influenced.

When a scirrhus of the pylorus lies upon the aorta, a pulsation may be communicated to it, raising the question of *aneurism of the abdominal aorta*, but the expansile pulsation of aneurism (Corrigan's sign) is wanting, as are the other symptoms of the affection, and if the patient is made to rest upon his hands and feet, the stomachic tumor falls away from the aorta and pulsation ceases.

Mikuliez claims that, by the use of his *gastroscope*, regular rhythmical motions can be seen when the pylorus is not the seat of cancer, and that such movements are absent when it is the seat of cancer.

Prognosis. Unfavorable. Internal medication offers no hope, the patient usually succumbing from starvation.

Gastric carcinoma occurring under thirty years of age is rapidly fatal, not conforming to the usual symptoms as seen later in life; the characteristic cachexia is commonly absent and hæmatemesis is rare.

Treatment. We possess no means of arresting the disease, although it is but fair to mention that in Germany *condurango* in the form of decoction is recommended as a specific in gastric cancer. I have faithfully used the fluid extract with some benefit for the accompanying gastritis, but without effect on the tumor.

Six operations have been recommended for the relief of stenosis of

the pylorus: 1st. Pylorectomy; 2d. Gastro-enterostomy; 3d. Gastrectomy; 4th. Gastrostomy; 5th. Duodenostomy; 6th. Digital divulsion of the pylorus. Professor Billroth has *excised* the pylorus, thereby prolonging life ten months in one case and five years in another.

During the past year (1898) two successful operations for the removal of the entire stomach have been reported, both patients being alive some weeks after.

For *acidity* and *fetor of the breath*, *acidum carbolicum*, gr. ¼–⅓ (0.016–0.022 Gm.), or *carbo animalis purificatus*, gr. x–xxx (0.65–2 Gm.), affords some relief.

For *vomiting* and *pain*, *bismuth* and *opium*, or *lavage* or the washing out of the stomach. The *lavage* should be performed an hour before breakfast, followed in half an hour with:

℞. Strychninæ sulph., ... gr. ss .032 Gm.
Acid. hydrochlor. dil., ... f℥iv 15. Cc.
Inf. condurango, . . . q. s. ad f℥viij ad 240. Cc.
M. et ft. tablespoonful before meals, diluted.

For *pain*, *morphina*, or the following, recommended by Osler:

℞. Morphinæ sulph., ... gr. ⅛ .008 Gm.
Sodii bicarb., ... gr. v .3 Gm.
Bismuth. subnit., ... gr. x .6 Gm. M.
Sig.—Repeated p. r. n.

Avoid stimulants.

GASTRIC DILATATION.

Synonyms. Gastrectasis; pyloric obstruction; pyloric stenosis.

Definition. An abnormal increase of the cavity of the stomach, with the walls either hypertrophied, or decreased in thickness; characterized by pronounced indigestion, vomiting of partly digested and partly decomposed food at intervals of a day or two, and noisy moving of flatus within the abdomen (borborygmus).

Causes. Most common cause a stricture of the pylorus, the result of cancer; pressure of tumor against the pylorus, preventing exit of stomachic contents. Loss of muscular tone, occurring in anæmia. Prof. Bartholow cites cases resulting in excessive beer-drinkers, who drank thirty to forty glasses of beer habitually, every day.

Pathological Anatomy. When obstruction exists at the pylorus, the whole organ is dilated, with hypertrophy of the muscular layer of the stomach. In dilatation without pyloric obstruction, the muscular layer is thinner than normal, paler in color, and presents signs of fatty degeneration; the mucous membrane is also pale, thin, and without rugæ.

Symptoms. Those of the disease producing the obstruction *plus* those of obstinate chronic gastric catarrh, with *characteristic vomiting;* the cavity having a greatly increased capacity, large accumulations take place, which are rejected every day or two, partly digested and partly decomposed. *Regurgitation* of partly digested aliment, acrid, acid, and offensive, is very common. *Bowels constipated*, the stools hard and dry.

Physical signs of gastric dilatation are: *on inspection*, abnormal prominence of the whole epigastric region, with a tumor in the *pyloric region* which seems to be connected with the stomach; *percussion*, if empty, tympanitic note extending to or below the umbilicus, having a metallic quality; if the stomach be filled, high-pitched flat note; *auscultation*, splashing and rumbling sound, the succussion sound being distinct if the body be shaken.

Diagnosis. Copious vomiting of food partly digested, once in twenty-four hours or less often, epigastric distress and pain resulting from foul-smelling and acid eructations and from obstinate constipation. And on *percussion* the tympanitic note of the stomach as low or lower than the umbilicus, with some dullness, may be due to food or liquid in stomach.

If a doubt then exist, give large amount of food and note dullness, or, what is not so pleasant, *sodii bicarbonas*, gr. xv (1 Gm.),with *acidum tartaricum*, gr. xx (1.3 Gm.), and the *tympanitic* outline of the stomach will be evident.

Dr. Leonard has determined the presence of gastric dilatation by the *X-ray* and use of bismuth solution to produce a shadow in stomach.

Penzoldt's modification of Piorry's method of determining gastric dilatation is to withdraw the contents of the stomach by means of the œsophageal tube and then refilling the stomach with fluid. By noting the lower limit of percussion dullness thus produced, the lower border of the stomach can be accurately determined.

Treatment. Regulated diet. Restrict the use of fluids, using a "dry diet" exclusively.

If the result of pyloric stenosis, one of the operations mentioned for pyloric cancer may be indicated.

Regardless of the cause, washing out the stomach with the stomach tube every day or two, gives relief, and, if no stricture be present, administer *strychninæ sulphas* or *nux vomica*, and very favorable results may follow.

GASTROPTOSIS.

Definition. A displacement of the stomach *downward*, associated with prolapse of the bowel (enteroptosis or Glénard's disease) and prolapse of the kidney (nephroptosis).

Causes. Relaxed condition of the abdominal walls due to impaired development or loss of tension, causing improper intra-abdominal pressure; wearing corsets or other tight, unyielding garments; occupations favoring stooping posture, leading to decreased tension of the abdominal walls, such as seamstresses, tailors, and shoemakers, or other sedentary work; frequent pregnancies, which stretch the abdominal muscles.

It is probable that there exists a predisposition to imperfect development of abdominal and other muscles, or their early loss of tension with wasting.

More common in women than men, as would be expected from a study of the causes.

Anatomical Conditions. The transverse colon is the first organ to prolapse, soon followed by the ascending colon. The stomach is tilted, as it were; its lower border reaching below the umbilicus, while its lesser curvature lies between the ensiform cartilage and the umbilicus. In some cases the pyloric end is down to or below the umbilicus without as much prolapse of the fundus. The right kidney is displaced and often floating or movable. The left kidney is less often displaced.

Any or all of the conditions named may be associated with any of the organic gastric conditions.

Symptoms. *Impaired digestion* with eructations of gases. *Distress* or feeling of weight after eating, often amounting to intense *pain*. Loss of flesh with marked *anæmia* and *neurasthenic* symptoms are almost characteristic of the gastric and intestinal prolapse. Constipation is the rule, although cases with diarrhœa have been reported.

Physical phenomena. In the standing position the lower part of the abdomen projects and the upper part sinks in. In the recumbent position the abdomen shows a lateral extension. Aortic pulsation is frequent. There is often "a ridge lying across the abdomen" to be determined by palpation. Glénard termed this ridge the "corde-colique transverse" and thought it was due to a prolapse of and partial occlusion of the transverse colon. Other observers think it is the pancreas that is felt on account of the prolapse of the transverse colon. Inflation of stomach often detects its prolapsed position with a lowered gastric splashing. The X-ray, with the aid of the bismuth solution for shadow, will determine the location of the organ.

Treatment. Unless surgery can give aid, medication is but palliative. Abdominal bandages are recommended, but seem of small use. The chief indication is to improve the general health.

GASTRIC HEMORRHAGE.

Synonyms. Hæmatemesis; gastrorrhagia.

Definition. Gastric hemorrhage is not, strictly speaking, a disease, but a *symptom;* still, vomiting of blood occurs under such a variety of conditions that a separate consideration is desirable.

Causes. Ulcer of the stomach; cancer of the stomach; cirrhosis of the liver; scurvy; purpura; hæmophilia; hemorrhagic malarial fever; congestion of the liver or spleen; cirrhosis of the liver; vicarious at menstrual period; yellow fever; toxic gastritis.

Symptoms. Added to the symptoms of the cause of the hemorrhage, are a *feeling of faintness* and *sinking at the pit of the stomach*, followed by the ejection of blood of a *black, grumous*, or *coffee-ground* appearance. Rarely, and then generally in gastric ulcer, the ejected blood may have a *bright red* appearance, the gastric juice not having had time to act upon it. If the amount of blood escaping into the stomach is large, *blood will be voided by stool.*

Diagnosis. *Hemorrhage from the lungs* may be confounded with gastric hemorrhage. In the former, the blood is red, is coughed up, not vomited, and is associated with a history of pulmonary disease. The chief point of distinction between pulmonary hemorrhage and the vomiting of red blood is that in the former you can discern râles on auscultating the chest, and they are absent in the latter. In

hemorrhage from the stomach there is almost invariably food mixed with the blood.

Prognosis. Depends entirely upon the cause, the most unfavorable being the result of either gastric ulcer, cancer, hepatic cirrhosis, or hæmophilia.

Treatment. Complete rest in bed. *Ice*, internally and applied in bladders over the epigastrium and along the spine, or *hot water*, as hot as can be borne, in quantities of four to six ounces at very frequent intervals.

Hypodermic injections of *morphinæ sulphas* quiet the patient's fear, and at the same time have a constringing effect upon the vessels. *Extractum ergotæ fluidum* or *ergotin* hypodermically after the patient is quieted, or *liquor ferri subsulphatis*, ♏j–v (0.06–0.3 Cc.), well diluted, by stomach.

Cases resulting from congestion of the liver or spleen are benefited by *saline purgatives*.

Allow no food by the stomach for several days, nourishing the patient by rectal alimentation.

The hemorrhage controlled, the future treatment is guided by the exciting cause.

GASTRALGIA.

Synonyms. Cardialgia; gastrodynia; stomachic colic; spasm of stomach; neuralgia of the stomach.

Definition. A painful condition of the sensory nerves of the stomach, induced by various sources of irritation; characterized by violent paroxysms of gastric pain and spasm, associated with feeble cardiac action, and symptoms of collapse.

Causes. The affection belongs to the group of neuralgias. The most important factor in its causation is general nervous depression or neurasthenia; other causes are gastric cancer or ulcer, malaria, rheumatic or gouty diathesis, syphilis, anæmia, and certain articles of diet. Occurring in chronic nervous affections, the so-called "gastric crises."

Symptoms. Like most neuroses, gastralgia is distinguished by its *paroxysmal* character. *Romberg* thus describes an attack:

"Suddenly, or after a feeling of pressure at the præcordium, there is severe *griping pain* in the stomach, usually extending to the back,

with a *feeling of faintness*, a shrunken countenance, cold hands and feet, and an *intermittent pulse*. The *pain* becomes so excessive that the patient cries out. The *epigastrium* is either *puffed out*, like a ball, or *retracted*, with tension of the abdominal walls. There is often *pulsation in the epigastrium*. External pressure is well borne, and not unfrequently the patient presses the pit of the stomach against some firm substance, or compresses it with his hands. *Sympathetic pains* often occur in the thorax, under the sternum, and in the œsophageal branches of the pneumogastric, while they are rare in the exterior of the body.

"The attack lasts from a few minutes to half an hour or longer; then the pain gradually subsides, leaving the patient much exhausted; or else it ceases suddenly, with eructation of gas or watery fluid, or with vomiting, and with a gentle, soft perspiration, or with the passage of reddish urine."

Besides such severe attacks, we often see *painful sensations in the epigastrium*, of various degrees of intensity, with passing faintness or sinking at the "pit of the stomach," associated with heartburn, or pyrosis, ending with sensation of hunger, drowsiness, and a free discharge of clear urine of low specific gravity.

Diagnosis. From *myalgia of the abdominal muscles*, by the pain of gastralgia being more acute and lancinating, accompanied by nausea and vomiting and the absence of tenderness on pressure.

From *intercostal neuralgia*, by the fact that in this affection the pain is in the left hypochondrium, with painful spots along the course of the nerve trunk and at the spine, and absence of nausea and vomiting.

From *gastric cancer*, by the age, character of the vomited matter, constancy of the pain, the cachexia, emaciation, *and the tumor*.

From *gastric ulcer*, by the localized pain and its constancy, with tenderness and vomiting of blood, and constant dyspeptic symptoms, which is not the case in gastralgia.

From *hepatic* or *gall-stone colic*, by the pain being to the right of the median line radiating to the right and to the right scapula and shooting toward the right ilium and the sclerotic jaundice after an attack.

Prognosis. As to perfect recovery, unfavorable, but not dangerous to life. A chronic affection, in that attacks are prone to return from time to time. The cause has much to influence a radical cure

Treatment. *For the paroxysm*, hypodermic injections of *morphinæ sulphas*, gr. ⅓–½ (0.02–0.03 Gm.), or the stomachic administration of the "compound of anodynes," the so-called *chlorodyne*, in doses of ♏x–xxx (0.6–2 Cc.) p. r. n. The relief afforded by opium in some form is so decided that it is apt to lead to the opium habit when the attacks are frequent. A mild attack may be relieved by *antipyrin*, gr. x (0.65 Gm.). A *hot-water bag* over the stomach is of great value. In recurring attacks Van Valzah recommends:

℞. Codein., ... gr. ¼ .016 Gm.
Ext. cannab. indicæ, ... gr. $\frac{1}{10}$ .006 Gm.
Atropinæ sulphas, ... gr. $\frac{1}{200}$ .00032 Gm.
Aconitinæ, ... gr. $\frac{1}{400}$ .00016 Gm. M.
Ft. capsul.
Sig.—One every four or six hours.

Galvanization often gives prompt relief.

In the interval, regulated diet and one or more of the following remedies: *argenti nitras*, *quininæ sulphas*, *arsenicum*, *bismuth salicylas*, *ferrum*, *liquor iodii comp.*, or small doses of *potassii iodidum*.

ATONIC DYSPEPSIA.

Synonyms. Dyspepsia; indigestion; heartburn; pyrosis.

Definition. A functional derangement of the stomach, with either deficient secretion in the *quantity* or *quality* of the gastric juice; characterized by disorders of the functions of digestion and assimilation and the presence of sympathetic nervous symptoms.

Causes. Imperfect mastication; bolting of food; eating large quantities of food; same diet long continued; depressed nervous system, from worry and fatigue; sedentary habits or occupations. It is often inherited.

Symptoms. *Perverted appetite*, capricious or lost; *difficult digestion*, a feeling of weight or fullness in the epigastrium; *acidity* from the decomposition of albuminoids; *heartburn*, *flatulency*, *regurgitation*, or *vomiting* of portions of partly digested food or acrid fluid—*water-brash* or *pyrosis*. *Pain* or *soreness* at the "pit of stomach" during digestion. *Tongue* either clean or broad, flabby, and pale, showing marks of the teeth. *Bowels* constipated; *urine* generally scanty and high-colored, with excess of urates or oxalates, or, in

persons of nervous type, it is pale, of low *specific gravity*, and contains phosphates. *Drowsiness* after meals, with *wakefulness* at night, *defective memory*, *headache*, and absent mental vigor, with *flashes of heat*, followed by more or less perspiration. Palpitation of the heart with irregularity in rhythm.

Varieties of Dyspepsia.—I. *Nervous dyspepsia*, atonic form, seen in active business or busy professional men, especially those of thin, spare build, of nervous temperament, who eat meals rapidly and hurry off to their business. These cases present all the marked nervous phenomena, such as drowsiness after meals, and feeling worse after a nap; inability for mental exertion after meals, defective memory, headaches, at times vertigo and sleepless nights. II. *Flatulent dyspepsia*, seen in hysterical individuals, and showing immense development of gas throughout the abdomen, associated with vertigo and mental worry or hypochondria. III. *Acid dyspepsia*, water-brash. Seen when the diet is coarse. Acidity of the gastro-intestinal canal and of the urine. IV. *Irritative dyspepsia.* Vomiting a prominent symptom. In these cases the tongue is small, red, and pointed.

Prognosis. With careful living, dyspepsia, functional in character, is curable. It has been aptly termed "remorse of the stomach."

Treatment. The most important indication is to regulate the diet. *Forbid saccharine, starchy, or fatty articles of food.* Eat small amounts at a time, underdone meats or "Salisbury steaks," eggs, fish, oysters, and green vegetables, with stale or brown bread. Perfect insalivation and mastication. *Rest after eating*, from a half to an hour. Allow but small quantities of liquids with the meals. In the vast majority of cases, *forbid the use of stimulants with the meals.*

Aid *digestion* with *pepsinum*, with or without *acidum hydrochloricum dilutum.*

℞.	Pepsini puræ, ... ʒj	4. Gm.	
	Acid. hydrochlorici dil., ... fʒiv	15. Cc.	
	Glycerini, ... fʒiv	15. Cc.	
	Aq. lauro-cerasi, ... fʒij	60. Cc.	M.

Sig.—One teaspoonful with meals, diluted.

Excellent results have followed the use of a new remedy known as *taka-diastase*, gr. ij–iv (0.13–0.26 Gm.) at meal time.

Stimulate stomachic peristalsis with *nux vomica, gentian*, or *cinchona.*

For *acidity, alkalies* at time of acidity, the very best being *sodii bicarbonas.*

For *flatulency, carbo animalis purificatus*, gr. x–xx (0.65–1.3 Gm.), or one or more of the carminatives, with *tinctura nucis vomicæ* before meals.

For *pyrosis, bismuth*, gr. xx (1.3 Gm.), and *pulvis aromaticus*, gr. v (0.32 Gm.).

For *vomiting, sodii* or *strontii bromidum* in small doses, or *acidum carbolicum*, gr. ⅙–¼ (0.011–0.016 Gm.), three or four times daily, or *chloral hydrate*, gr. x–xv (0.65–1 Gm.), in a demulcent by the mouth or rectum, repeated p. r. n.

For *constipation, resina podophyllum* at bedtime, or Hunyadi Janos water before breakfast, hot, or—

℞.	Ext. cascaræ sagradæ fld., . . .	f℥j	30. Cc.
	Tinct. nucis vomicæ, ...	f℥ss	15. Cc.
	Syr. zingib., ...	f℥ss	15. Cc.
	Inf. sarsaparillæ, . . . q. s. ad	f℥iij	ad 90. Cc. M.

Sig.—Teaspoonful three times daily, diluted.

For *anæmia, massa ferri carbonatis* or *ferri lactas.*

Irrigation of the stomach or lavage often gives remarkable relief. The drinking of *hot water* one-half to one pint an hour before meals is of benefit.

A homely but efficient combination for atonic dyspepsia associated with scanty, acid urine and constipation, is—

℞.	Sodii bicarbonatis, ...	℥ij	8. Gm.
	Tinct. nucis vomicæ, ...	f℥iv	15. Cc.
	Tinct. capsici, ...	f℥j	4. Cc.
	Tinct. rhei, ...	f℥iss	45. Cc.
	Inf. gentian. comp., ... ad	f℥vj	ad 180. Cc. M.

Sig.—Half tablespoonful after meals, in water.

I have seen excellent results in many cases of dyspepsia and indigestion from the following combination:

℞.	Papoid (puræ), ...	gr. xxx	2. Gm.
	Sodii bicarb., ...	gr. lx	4. Gm.
	Pulv. zingib. jam., ...	gr. v	.3 Gm. M.

Et capsul. or pil. No. xx.

Sig.—One at meal-time and bedtime.

DISEASES OF THE INTESTINAL CANAL.

INTESTINAL INDIGESTION.

Synonym. Intestinal dyspepsia.

Definition. A derangement in the functions of intestinal digestion, resulting in the more or less complete decomposition of the *chyme*, caused by defects in the pancreatic, biliary, or intestinal secretions or from deficient peristalsis, one or more of these, singly or combined; characterized by abdominal pain and distention and tympanites developing some hours after meals, and nervous perturbation, anæmia, and emaciation.

Causes. Imperfect diet; over-eating; irregularity in eating; deficient exercise; worry; immoderate use of tobacco or stimulants; diseases of the stomach, intestinal tract, liver, or pancreas; malaria. Frequently inherited.

Symptoms. Intestinal indigestion may be either *acute* or *chronic*, the latter the more common.

Acute variety, the result of an irritant in the duodenum, rapidly developed *pain*, *flatulency*, *borborygmi*, slight *feverishness*, coated tongue, loss of appetite, headache, *pains in the limbs*, usually terminating in a mild attack of *diarrhœa*.

If the attack develops rapidly, the sudden formation of gases causes a paroxysm of *colic*.

Severe attacks are associated with disordered hepatic function, light-colored stools, slight jaundice, and high colored urine. In these severe attacks the symptoms develop gradually with general malaise, or abruptly with *chill* or chilliness followed by *fever* 100°–102°, increased pulse, headache with or without *vomiting*, the tongue white coated, soon becoming red, dry, and glazed, with abdominal pains increased by pressure, tympanites and flatulency succeeded by *diarrhœa*, the stools averaging from two to a dozen, at first soft and normal with fecal odor and color, later becoming watery and frothy with a most persistent, offensive odor, containing mucus and particles of undigested food. The reaction of stools is alkaline, rarely acid. The

microscope shows epithelial cells, round cells, occasionally blood-cells, bacteria, Charcot's crystals, crystals of oxalate of calcium, calcium phosphate, etc. Cramps in lower limbs, often very severe.

Chronic variety, resulting from a greater or less decomposition of the partly altered food from the stomach. *Pain*, varying in character, occurring from two to four or six hours after meals, with *slight tenderness* and some *fullness* in the right hypochondrium, epigastrium, or the umbilical region. *Tympanites* and *borborygmi* are marked, the result of gaseous accumulations which have developed from the decomposition of the intestinal contents. *Dyspnœa*, the result of pressure against the diaphragm, is of frequent occurrence. Marked nervous phenomena develop, the result of the anæmia from deficient assimilation and from the depressing influence on the nervous system of the absorption of the "gases of decomposition."

The *skin* is harsh and dry, the *bowels* are sluggish or *constipated*, the *urine* is high colored, of increased density, decidedly acid, and, on cooling, deposits lithates, uric acid, and oxalate of lime crystals.

Functional derangement of the liver follows after a time, adding to the general discomfort.

Anæmia and *emaciation* result if the attack be protracted from the imperfect secondary assimilation.

Diagnosis. With our present knowledge it is usually impossible to designate forms of intestinal indigestion due to defects in the quantity or quality of either the pancreatic, biliary, or intestinal secretions.

Acute intestinal indigestion differs from gastric indigestion in the time of development of the various phenomena, in the latter the symptoms appearing almost immediately after meals, while in the former not appearing until two, four, or six hours after.

Chronic intestinal indigestion may mislead the physician if the various nervous phenomena are of a marked character, and a careful history of the case is not developed.

Prognosis. Favorable if proper and early treatment be inaugurated, unless the result of an organic lesion.

Treatment. *Acute variety*, the result of undigested food, is best treated by *opium* in some form, to relieve the acute suffering, *warmth* to the abdomen, and a prompt cathartic to cause its rapid expulsion,

or six or eight calomel powders two or three hours apart, followed the next morning by a saline—

℞. Hydrarg. chlor. mit.,	gr. ⅓	.02 Gm.	
Sodii bicarb.,	gr. ij	.13 Gm.	
Pulv. ipecac.,	gr. ⅙	.01 Gm.	
Sacch. lact.,	gr. iij	.2 Gm.	M.

Ft. charta.

After which stimulate the gastro-intestinal canal with:

℞. Tinct. nucis vomicæ,	f℥iv	15. Cc.	
Acid. hydrochlorici dil.,	f℥iv	15. Cc.	
Tinct. card. comp.,	f℥iv	15. Cc.	
Ess. pepsin.,	q. s. ad f℥iij	ad 90. Cc.	M.

SIG.—Teaspoonful every three hours, diluted.

For the more severe variety of intestinal indigestion (or catarrh), wash out large bowel with—

℞. Magnesii sulph.,	℥j	30. Gm.	
Glycerini,	f℥j	30. Cc.	
Aquæ bul.,	f℥iv	120. Cc.	M.

Slowly injected into bowel from a fountain syringe.

Internally either of the following excellent combinations:

℞. Naphtalini,	gr. xxx	2. Gm.	
Bismuth. salicyl.,	gr. lxxx	6. Gm.	
Acid. carbolici,	gr. iv	.26 Gm.	
Glycerini,	f℥j	30. Cc.	
Aq. chloroformi,	f℥iij	90. Cc.	M.

SIG.—Two teaspoonfuls every two or three hours, diluted.

Or—

℞. Sodii phosphat.,	℥j	30. Gm.	
Acid. phosph. dil.,	f℥iv	15. Cc.	
Syr. limonis,	f℥j	30. Cc.	
Aq. chloroformi,	f℥iij	90. Cc.	
Aq. menth. pip.,	f℥iiiss	100. Cc.	M.

SIG.—One tablespoonful after meals, well diluted.

In all cases carefully designate the character and amount of food, and times of administration.

Chronic cases. Of the first importance is the diet, which should be restricted in amount and confined almost entirely to articles which are readily digested in the stomach, such as beef, eggs, and milk.

Aid intestinal digestion by the administration of—

℞. Papoid, ... gr. j–ij .065–.13 Gm.
Naphtalini, ... gr. j .065 Gm.
Ext. nucis vomicæ, ... gr. ⅓ .022 Gm. M.
Ft. pil.
One such to be taken every four or six hours.

Or *liquor pancreaticus*, f℥j–iv (4–15 Cc.); or *extractum pancreatis*, gr. ij–v (0.13–0.3 Gm.), with *sodii bicarbonatis*, gr. v–x (0.3–0.6 Gm.), two or three hours after meals; or *fel bovis purificatum*, gr. j–iij (0.065–0.2 Gm.), after meals.

Excellent results from the use of the following pill:

℞. Sodii arseniat., ... gr. $\frac{1}{20}$ .003 Gm.
Strychninæ sulph., ... gr. $\frac{1}{32}$ .002 Gm.
Pepsinæ puræ, ... gr. ij .13 Gm.
After each meal.

For constipation, bitter waters, such as Bedford, Friedrichshall, Pullna, or Hunyadi Jânos, or *resina podophyllum*, or *extractum cascaræ sagradæ fluidum*, at bed-time.

INTESTINAL COLIC.

Synonyms. Enteralgia; tormina; gripes.

Definition. A spasmodic contraction of the muscular layer of the intestinal tube; characterized by acute paroxysmal pain near the umbilicus, relieved by pressure, and associated with feeble cardiac action.

Causes. Constipation; presence of indigestible food; collections of flatus; an abnormal amount of bile discharged into the intestines; lead poisoning; syphilis; chronic malaria; rheumatism; hysteria.

Symptoms. *Romberg* thus describes a paroxysm: "There are attacks of *pain*, spreading from the navel over the abdomen, alternating with intervals of ease. The pain is *tearing*, *cutting*, *pressing*, most frequently *twisting*, *pinching*, accompanied by peculiar *bearing-down pains*. The patient is restless, and seeks *relief* in changing his position and in *compressing the abdomen;* his surface may be cold and his features pinched. The *pulse is small and hard*. The abdomen is tense, whether puffed up or drawn inward. There are

often nausea and *vomiting*, and *desire* for *stool*. There is usually constipation, but sometimes the bowels are regular or even too loose. *Duration* from a few minutes to several hours, relaxing at intervals. The attack ceases suddenly, with a feeling of the greatest relief, although some soreness remains for a few days."

Lead colic is always preceded by symptoms of lead poisoning, to wit: slate-colored skin, dark gums showing a blue line, heavy breath, with sweetish metallic taste, obstinate constipation, impaired appetite, slow pulse, and contracted abdominal walls.

Diagnosis. *Gastralgia* differs from colic, in the pain being in the epigastric region and associated with disorders of digestion.

In *hepatic colic*, or the passage of gallstones, the pain is in the hepatic region, attended with soreness over the gall bladder, and retching and vomiting, followed by jaundice and the presence of bile in the urine.

In *nephritic colic*, the pain follows the course of one or both ureters, shooting to loins and thigh, with retraction of the testicle of the affected side, strangury, and bloody urine.

In *uterine colic*, the pain is in the pelvis, and associated with menstrual disorders, in fact, a dysmenorrhœa.

In *ovarian colic* or neuralgia, pain or pressure over the ovaries, with hysterical phenomena.

Inflammatory disorders of the abdomen differ from colic by the presence of fever and tenderness on pressure.

Prognosis. Most favorable. Death is the rarest termination possible.

Treatment. Relief of pain is the first indication, and is best accomplished by a hypodermic injection of *morphinæ sulphas*, gr. ⅙–⅓ (0.011–0.022 Gm.), which has the additional advantage of relaxing the spasm, thereby favoring the action of *purgatives*, which should soon follow. One of the best in colic, no matter from what cause, is *massæ hydrargyrum*, gr. v–x (0.3–0.6 Gm.), or *hydrargyri chloridum mite*, gr. ½ (0.03 Gm.) every half hour until four or five grains are taken, followed by a mild *saline cathartic*.

After the relief of the pain and free action of the bowels, the cause of the attack should be ascertained and corrected, to prevent future suffering.

For *lead colic*, *morphinæ sulphas* for the pain; *oleum ricini* or *magnesii sulphas*, ʒj (4 Gm.) every hour, for the constipation, and

potassii iodidum, gr. v–x (0.3–0.6 Gm.) after meals, or *syrupus acidi hydriodici*, f℥j–iv (4–15 Cc.) after meals, diluted, to eliminate the metal from the system. Excellent results often follow a free or several small venesections in lead poisoning.

Gratifying results in attacks of lead colic have been reported from tumblerful doses of *oleum olivæ*, repeated until some six ounces (180 Cc.) have been used. It is said to be curative in lead poisoning, in daily doses of two ounces, continued for some time.

CONSTIPATION.

Synonyms. Intestinal torpor; costiveness.

Definition. A functional inactivity of the intestinal canal, either due to atony of the muscular coat, causing lessened peristalsis, or to a deficiency of intestinal and biliary secretion; characterized by a change in the character, frequency, and quantity of the stools.

Causes. Dyspepsia; character of the food; habits of the patient, as sedentary habits and neglecting calls of nature; diseases of the stomach and liver; malaria; lead poisoning; syphilis.

Symptoms. In the normal condition the majority of persons have *one stool* each day, although it is not to be considered abnormal if more or less than that number occur.

The *bowels* are moved every *three* or *four days*, with great *straining* and *distress*, the *face* often *flushed*, the *cerebral vessels full;* leaving an uneasy sensation in the rectum.

Or in other cases the bowels may be relieved once a day, but the *stool is small and hard*, causing great distress, and tenesmus, or teazing.

Another group of cases have *frequent stools* during the day, *small* and *non-formed*, due to retained hardened feces acting as an irritant upon the rectum.

The change in the character of the stools is soon followed by symptoms of dyspepsia, headache, mental torpor, vertigo, palpitation on exertion, and in many cases with great distention of the abdomen.

Prognosis. Death never results from functional constipation.

Treatment. The successful treatment depends upon the *removal of the cause* and the hearty *co-operation of the patient.*

First, the patient must have a *regular hour* each day for *going to*

stool, and must *remain a sufficient time* to permit a thorough evacuation of the bowels, assisting, until habit of daily stools is formed, by a warm water injection.

Second, the diet must be carefully regulated, as concentrated foods increase the costive habit, so that those predisposed should eat bulky foods, much vegetables and fruits.

Third, purgative mineral waters or cathartic medicines are to be *used with caution*, their reckless administration often causing more injury than benefit.

Fourth, either of the following formulæ, aided by the enforcement of the above rules, will give good results:

℞. Ext. nucis vomicæ, ... gr. ¼ .016 Gm.
Ext. belladonnæ alco., ... gr. ¼ .016 Gm.
Ext. aloes aqua., ... gr. ss .032 Gm.
Pulv. rhei, ... gr. j .065 Gm.
Olei cajuputi, ... ♏ j .06 Cc. M.
In pill, at bedtime; and after a week, every second or third night.

℞. Resina podophyl.,
Ext. physostig.,
Ext. belladonnæ alco.,
Aloïni, ... aa gr. ¼ aa .016 Gm.
In pill, every night, or second or third night.

℞. Ext. cascaræ sagradæ fid., . . . ♏xx 1.3 Cc.
Glycerini, ... ♏xx 1.3 Cc.
Syr. sarsaparillæ, ... ♏xx 1.3 Cc.
Hour after meals, or once a day, as indicated.

All cathartics and purgatives are improved by the addition of a small amount of sulphur præcipitatum.

One of the very best purgatives is an early morning dose of *magnesii sulphas* (Epsom salts). Another excellent tonic purgative is *aloïnum*, gr. ⅛–¼ (0.008–0.016 Gm.), after meals.

Success often follows an enema of *glycerinum*, ʒj–iv (4–15 Cc.), or a suppository of *glycerinum*.

Electricity to the abdomen is worth a trial; one pole over abdomen, the other at anus, using either galvanism or faradism. Kneading the abdomen is frequently of benefit.

DIARRHŒA.

Synonyms. Enterorrhœa; alvine flux; purging.

Definition. Frequent loose alvine evacuations, without tenesmus; due to functional or organic derangement of the small intestines, produced by causes acting either locally or constitutionally.

Causes. Those acting locally, such as *indigestion, indigestible food, impure food and water, irritating matters* or *secretions* poured into the bowels, or *entozoa*, cause the flux by a direct irritation of the mucous surface.

Attacks of diarrhœa due to constitutional derangement may be secondary to such diseases as *tuberculosis, pyæmia, albuminuria, typhoid fever*, or disturbances of the functions of other organs, giving rise to *vicarious fluxes.*

Atmospheric changes, as well as a sudden mental shock, will often produce an attack of diarrhœa in those predisposed.

Forms. Acute and chronic.

Symptoms. Acute diarrhœa presents itself in several varieties, the result of the particular cause.

Feculent diarrhœa. A few hours after meals the patient feels *colicky pains and flatulency*, with a *desire for stool.* There is often *nausea, coated tongue*, but seldom vomiting. The *pain* is generally relieved by the purging which ensues. The *stools* have a *feculent* character, are of brown fluid, containing fæces, often offensive, the color becoming lighter after four or five evacuations. Constitutional symptoms are wanting.

This form is the result of overeating, eating too rapidly, or indigestion of different forms, or worms in the intestinal canal, and patients generally recover in a day or two.

Lienteric diarrhœa. In this form there is, with the frequency of evacuations, a *want of assimilation* of *food*, which passes through the intestines more or less unaltered. The *stools* are frequent, *mucous* or *serous*, more or less *covered with bile*, mixed with *undigested food.* In this form the patients emaciate rapidly, owing to the deficient assimilation, the digested portions of the food being hurried on by the increased peristalsis of the irritated bowel. It is usually subacute in its course.

Bilious diarrhœa. The *stools* are frequent, *green or yellow*, with

scalding sensations at the anus and *griping pains* in the abdomen. Excessive biliary secretion is the irritating cause.

Any of the above forms may pass into chronic diarrhœa by exciting permanent diseases of the intestines. Diarrhœa due to constitutional causes will be mentioned when speaking of those conditions.

Chronic diarrhœa results from repeated attacks of the acute form, or is the result of some cachexia. The *symptoms*, so far as the *stools* are concerned, are much the same as in the acute disease, except they are *paler*, whence it has been termed *white flux;* in addition, *dyspeptic* symptoms, *aphthous* condition of the mouth and tongue, *flatulency*, *colic*, *emaciation*, and *anæmia*. The appetite is at times capricious, again impaired. Exacerbations result from indiscretions in diet and from the sudden onset of damp weather.

Prognosis. Favorable in *feculent* and *bilious* forms; unfavorable in *lienteric* and *chronic* forms when emaciation begins. Diarrhœa occurring as a symptom, the prognosis is controlled by the original disease.

Treatment. *Acute diarrhœa.* If the tongue is heavily coated, the breath fetid, and the stools not excessive in number, it is well to clear the intestinal canal with a laxative such as *oleum ricini* or a *saline*. For children between one and two years of age:

℞. Pulv. ipecac., ... gr. ss .032 Gm.
Pulv. rhei, ... gr. ¼–⅓ .016–.022 Gm.
Sodii bicarb., ... gr. ss–ij .032–.13 Gm. M.
Every four hours until the character of the stools changes.

As a rule, however, the stools have become so frequent when advice is sought that the time for laxatives has passed, and some one of the following combinations is indicated:

℞. Salol, ... gr. xx–xxx 1.3–2. Gm.
Bismuth subnit., ... ʒj 4. Gm.
Sacch. lac., ... ʒj 4. Gm. M.
Ft. chart. No. x.
Sig.—One every two or three hours, reducing the dose for children

Or—

℞. Bismuthi salicylat., ... gr. xxx 2. Gm.
Morphinæ sulph., ... gr. j .065 Gm. M.
Ft. chart. No. vj.
Sig.—One every three hours.

Or the following modification of "Squibb's diarrhœa mixture":

℞. Tinct. opii deodorat., ... f℥iv 15. Cc.
Tinct. camphoræ, ... f℥iv 15. Cc.
Tinct. capsici, ... f℥ij 8. Cc.
Chloroformi puræ, ... f℥iss 6. Cc.
Spts. vini gallici, ... f℥j 30. Cc.
Vini pepsini, ... ad f℥iij ad 90. Cc. M.

Sig.—One teaspoonful, p. r. n.

Or the following, which I have always found successful:

℞. Tinct. opii deodorat., ... f℥iv 15. Cc.
Spts. chloroformi, ... f℥ij 8. Cc.
Acid. sulphuric. dil., ... f℥j 30. Cc.
Vini pepsini, ... q. s. ad f℥iij ad 90. Cc. M.

Sig.—One teaspoonful in water after each stool.

For the *bilious* form:

℞. Hydrargyri chlor. mitis, ... gr. 1/8 .008 Gm.
Sodii bicarb., ... gr. ij .13 Gm.
Pulv. opii, ... gr. 1/4 .016 Gm. M.

In powder, every two or three hours, until eight powders are used, followed by large doses of *bismuthum* and *pepsinum*.

In all acute forms *restricted* and *regulated diet* are imperative, *pure milk* with *liquor calcis* being the most suitable.

In adults, an *opium* suppository often checks a flux that is uninfluenced by opium internally.

In *lienteric* or dyspeptic diarrhœa a carefully regulated diet and either of the following combinations:

℞. Pepsini glycerit., ... f℥j 30. Cc.
Liq. potassii arsenit., ... ♏xx 1.3 Cc.
Tinct. opii deodorat., ... f℥ij 8. Cc.
Aq. chloroformi, . . . q. s. ad f℥iij ad 90. Cc.

Sig.—One teaspoonful at meal-time.

Or—

℞. Papoid, ... gr. xx 1.3 Gm.
Bismuth. subnit., ... ℥j 4. Gm. M.
Ft. chart. No. x.

Sig.—One at meal-time.

Chronic diarrhœa. Bismuth, gr. xxx–xl (2–2.6 Gm.), in milk, every four hours; *Hope's camphor mixture*, f℥j (30 Cc.), every four

hours; or *cupri sulphas*, gr. $\frac{1}{12}$ (0.005 Gm.), *ext. opii*, gr. $\frac{1}{12}$ (0.005 Gm.), every four hours; or *argenti nitras*, gr. $\frac{1}{6}$ (0.01 Gm.), *ext. opii*, gr. $\frac{1}{3}$ (0.011 Gm.), every five hours; may all be used with more or less success; when *dry tongue* and *great flatulency* use:

℞.	Ol. terebinthinæ, ...	f℥j	4. Cc.
	Ol. amygdal. express., ...	f℥ss	15. Cc.
	Tinct. opii, ...	f℥ij	8. Cc.
	Mucil. acaciæ, ...	f℥iv	15. Cc.
	Aq. lauro-cerasi, ...	f℥ss	15. Cc. M.

Sig.—f℥j every three or four hours, diluted.

The diet should be nutritious in character, and moderate stimulants are indicated. Activity of the skin and kidneys should be encouraged.

All varieties of intestinal catarrh or diarrhœa are benefited by a few days' rest in bed and daily hot baths.

CATARRHAL ENTERITIS.

Synonyms. Intestinal catarrh; acute diarrhœa; inflammation of the bowels.

Definition. A catarrhal inflammation of the mucous membrane of the small intestines; characterized by fever, pain, tenderness, and looseness of the bowels. When the catarrh is limited to the duodenum it is termed *duodenitis*, and there is some jaundice.

Pathological Anatomy. There first ensues *hyperæmia* of the mucous membrane and intestinal glands, manifested by *redness*, *swelling*, and *œdema;* this is followed by *increased secretion*, and an *overgrowth* and *desquamation* of the epithelium, together with a copious *generation of young cells*. As a result of the hyperæmia, rupture of the capillaries and extravasation of blood often occur.

The swollen glands show a strong tendency to ulcerate. This catarrhal process may involve the entire tube or be limited to portions of it. If the catarrhal changes extend to the *ileum*, the solitary and Peyerian glands show swellings that might be mistaken for the changes of typhoid fever.

Causes. A specific virus seems probable in some cases. Perhaps a ptomaine poisoning. Improper and indigestible food; summer

temperature and exposure to cold and wet, while perspiring. Swallowing fish-bones, cherry-stones, unmasticated kernels of nuts, etc.

Symptoms. Begins with *languor*, followed by *chilliness* and *fever*, the temperature ranging at 102°–103°; this is followed by *pain*, colicky and paroxysmal in character, situated above the umbilicus, *localized tenderness*, and *loose evacuations*. *Nausea* and *vomiting* often occur. The *bowels* are at first constipated, followed by persistent diarrhœa; the *stools* contain but *little fecal matter*, are *yellow* or *greenish-yellow* in color, mixed with *undigested food;* if the stools are numerous, they become whitish and watery, the so-called "*rice-water*" discharges. No blood in the stools. The appetite is impaired, and this, with the want of assimilation and great waste, soon produce extreme *weakness* and *emaciation*, which is always more marked in children. I have frequently noted a peculiar abdominal eruption in severe cases of intestinal catarrh, occurring as isolated dark-red spots, larger than those of typhoid fever, lasting, each, twenty-four hours, disappearing on pressure and with the decline of fever.

Duration. In mild cases, four or five days; severe cases continue, more or less marked, for a week or two.

Diagnosis. From *colic*, by the absence of tenderness and fever, and presence of constipation and its paroxysmal character.

From *typhoid fever*, by the absence of prodromes, characteristic step-like temperature record, characteristic eruption, enlarged spleen, and peculiar character of the stools.

For points of distinction from *dysentery* or *peritonitis*, see those affections.

Prognosis. Favorable, if early and proper treatment is employed.

Treatment. *Rest the bowels* by a restricted diet, such as milk and lime-water, or weak mutton or chicken soups, with well-boiled rice added.

Keep the patient quiet in bed, a difficult matter in the case of children.

For *adults*, *opium* is the remedy, in doses to control the symptoms; mild doses do well with—

℞. Ext. opii, ... gr. ¼–½ .016–.032 Gm.
Camphoræ pulv., ... gr. iij .2 Gm. M.
In pill, every three hours.

Or—

℞. Tinct. opii deodorat., ... ♏x .6 Cc.
Liq. potassii citrat., ... f℥ij 8. Cc. M.
Every hour until opium effect.

The strength and the frequency of administration of either of these formulæ must be governed by the severity of the attack.

Salol, gr. j–iij (0.065–0.2 Gm.), alone or combined with *bismuthi salicylas*, gr. x–xv (0.6–1 Gm.), every few hours, is often of value in intestinal catarrh, although my experience is more favorable to opium.

If *vomiting* is annoying, all other treatment must be discontinued until it has been controlled, the following being usually efficient:

℞. Hydrargyri chlor. mite, ... gr. ⅛ .008 Gm.
Sodii bicarbon., ... gr. ij .13 Gm.
Sacch. lac., ... gr. ij .13 Gm. M.
Give every hour or two, dry, on tongue.

For *children:*

℞. Tinct. opii deodorat., ... ♏j .06 Cc.
Bismuth. subnit., ... gr. v .32 Cc.
Mist. cretæ, ... f℥j 4. Cc. M.
Every two hours, for a child of one year.

If the disease shows the least tendency to linger, the *acid* treatment should be substituted, one of the best formulæ being "Hope's Camphor Mixture." The following, which I have used with much success in the insane wards of the Philadelphia Hospital, where, at times, we see a good deal of intestinal catarrh, and which I have named "Mistura enterica," is generally satisfactory:

℞. Spts. camphoræ, ... f℥j 30. Cc.
Acid. sulphurici dil., ... f℥iss 45. Cc.
Tinct. opii deodorat., ... f℥j 30. Cc.
Tinct. capsici, ... f℥ss 15. Cc.
Spts. chloroformi, ... f℥ss 15. Cc.
Spts. vini gallici, . . q. s. ad f℥vj ad 180. Cc. M.
SIG.—One to two teaspoonfuls, well diluted, every three or four hours.

Locally. Poultices, warm fomentations, such as a turpentine stupe, or *ung. belladonnæ* or *oleum camphoratæ*, are agreeable.

CROUPOUS ENTERITIS.

Synonym. Membranous enteritis.

Definition. A croupous inflammation of the mucous membrane of the small intestines; characterized by tenderness, paroxysmal pain, moderate fever, and the formation and discharge at stool of membranous shreds or casts.

Causes. A disease of adult life. The female sex more liable than the male, and neuralgic, nervous, hysterical, or hypochondriacal subjects are more subject to it than are other types.

A peculiar state of the nervous system seems necessary to its production. It is not a frequent disease.

Pathological Anatomy. A subacute inflammation of the small intestine, during which the mucous membrane becomes covered with a whitish or grayish-white, firmly adherent, membranous deposit, cemented together by a coagulable exudation, and prolonged by rootlets from the under surface into the intestinal follicles.

Symptoms. Begins by *feverishness*, feeling of *soreness* and *distention* of the abdomen; these are followed by *pains* of a colicky character, severe and depressing, felt around the *umbilicus*, associated with *tenderness*, continuing for half an hour, an hour, or longer, and after a longer or shorter interval occurring again; these phenomena continue for a day or two, when *looseness of the bowels* with distressing *pain and tenesmus* occur, the *stools* containing *mucus*, with or without *blood*, and *shreds of membrane* or *cylindrical casts of the bowel*. Great relief follows the discharge of shreds, although a *feeling of rawness* or *soreness* persists for a few days.

Preceding the local manifestations of the disease are attacks of hysteria, hypochondriasis, neuralgia, nervousness, or excitability.

The paroxysms recur at intervals of a week or two, or after several months; as long an interval as three years between attacks is recorded.

Diagnosis. *Peritonitis* may be suspected until the characteristic stools occur.

Dysentery is excluded when the shreds and casts of membrane appear.

Prognosis. Favorable as to life, but one of the most difficult of diseases to eradicate.

Treatment. The *diet* is an important factor, and preference should be given to coarse articles instead of to liquids.

For the *pain* and *suffering*, *opium* in some form is indicated, the most effective being a hypodermic injection of *morphinæ sulphas*.

For *constipation* during a paroxysm, an emulsion of *oleum ricini* with *terebinthina* is of benefit. Constipation must always be avoided.

To prevent a return of the paroxysm, either *liquor potassii arsenitis*, ♏j-ij (0.06–0.12 Cc.), before meals, or *hydrargyri chloridum corrosivum*, gr. $\frac{1}{64}$ (0.001 Gm.), three times a day, with a course of *oleum morrhuæ*, seems to answer in the majority of cases. Prof. Da Costa speaks highly of *pix liquida* in some form, as an alterative to the mucous membrane.

CHOLERA MORBUS.

Synonyms. Sporadic cholera; English cholera; bilious cholera.

Definition. An acute catarrhal inflammation of the mucous membrane of the stomach *and* intestines, of *sudden* onset; characterized by violent abdominal pains, incessant vomiting and purging, cold surface, rapid, feeble pulse, spasmodic contractions of the muscles of the abdomen and extremities, and prostration.

Causes. A disease of summer and early autumn, climatic influence being an important factor. Its prevalence during certain seasons seems to indicate a specific cause. Irritants of all kinds, unripe fruits and vegetables, and fermentation of food. Probably a ptomaine poisoning.

Pathological Anatomy. Cases in which death has occurred within a few hours present no pathological changes.

Generally, however, the gastro-intestinal mucous membrane is congested and denuded of epithelium; the solitary and Peyerian glands are swollen and prominent. The blood is thick, and dark in color; the kidneys are enlarged and congested; and in prolonged attacks there are appearances of granular changes in the muscular system.

Symptoms. Onset sudden and violent, and, unfortunately, generally *after midnight*, with chilliness, *intense nausea*, *vomiting*, *and purging*, accompanied with distressing burning or tearing abdominal *pains* or *colic*. The *vomited matter* at first consists of the ordinary

contents of the stomach, and the *stools* of ordinary fæces, but soon the *discharges* by vomit and stool are *liquid, whitish*, or of a *green* or *yellowish* tint; if the attack is severe or protracted, the discharges are of the "*rice-water*" character. The patient is rapidly *emaciated* and *reduced* in strength, the body shrinks, the *surface is cold* and covered with a *clammy sweat*, and the *pulse is small and feeble*. *Intense thirst* is present, and when drink is given it is at once rejected.

Aggravating the distress of the patient are *severe cramps* of the muscles, and especially those of the calves, and of the flexors of the thighs, forearms, fingers, and toes.

Termination. *Mild cases* often terminate favorably without treatment, the patient able to be around in a day or two, although weak.

Severe cases, the vomiting and purging cease after some hours, but the patient remains weak, with irritable stomach and bowels for a week or two.

Grave cases, the true cholera type, recover from the prostration very gradually; reaction coming on slowly and usually passing into a typhoid condition of some weeks' duration.

Diagnosis. *Asiatic cholera* and cholera morbus are easily confounded during an epidemic of the former, and there are no positive points of discrimination, unless the *comma bacilli* of Koch are proven to be always in the true cholera stools.

Irritant poisons, such as tartar emetic, elaterium, or other substances, cause vomiting and purging, similar to cholera morbus, and are only discriminated from it by the clinical history and cause.

Prognosis. In the majority of cases favorable. The mortality is about five per cent.

Treatment. *At once*, regardless of the cause, a hypodermic injection of *morphinæ sulph.*, gr. ⅛–⅓ (0.008–0.022 Gm.), and *atropinæ sulph.*, gr. $\frac{1}{120}$ (0.00054 Gm.), to be repeated in half an hour if no improvement; for patients who object to the hypodermic method, *opium* in some form by the mouth or rectum, giving the preference to the liquid preparations.

Camphora and *opium* combined often act well, or the "enteric mixture" mentioned on page 111, and if much depression, small doses of *brandy* or *dry champagne*.

The *intense thirst* must not be gratified by the use of liquids, unless very *hot*, but small *pellets of ice* by the stomach are grateful.

If the vomiting and purging continue, make use of—

℞. Bismuth. subnit., ...	gr. xx	1.3	Gm.	
Acid. carbol., ...	gr. ½	.01	Gm.	
Glycerini, ...	♏xx	1.3	Cc.	
Aquæ, ...	f℥iv	15.	Cc.	M.

Every hour, in water.

If the vomiting is so severe that no opportunity occurs for the medicament to come in contact with the gastric mucous membrane, an enema of *chloral*, gr. x–xv (0.6–1 Gm.), in some demulcent with *tinctura opii deodorati*, ♏x–xx (0.6–1.2 Cc.), acts often like magic in quieting the distress of the tortured patient.

The closer the case approaches the true cholera type, the more severe are the *muscular cramps*, and their treatment demanded. Prof. Da Costa suggests—

℞. Chloral, ...	ʒiv	15.	Gm.	
Ung. petrolei, ...	℥j	30.	Gm.	M.

To be rubbed over the affected muscles.

Dr. Bartholow suggests—

℞. Chloral, ...	ʒiij	12.	Gm.	
Morphinæ sulph., ...	gr. iv	.26	Gm.	
Aquæ, ...	f℥j	30.	Cc.	M.

Sig.—Twenty minims, hypodermically, repeated p. r. n.

Locally, *sinapis*, in the form of poultices of the dry powder, should be applied to the abdomen, or *terebinthina* stupes, or the hot-water bag.

The after treatment depends upon the symptoms, generally an *acid mixture* and a *regulated diet*, with tonic doses of *quininæ sulphas*, are indicated.

ENTERO-COLITIS.

Synonyms. Inflammatory diarrhœa; ulcerative entero-colitis.

Definition. A catarrhal inflammation of the lower portion of the small—ileum—and the upper portion of the large intestines, with a great tendency to ulceration of the intestinal glands if the catarrh becomes chronic; characterized by moderate fever, nausea, vomiting, diarrhœa, swollen abdomen, pain, and emaciation. A common disease of childhood.

Causes. Improper and indigestible food; summer temperature; impure air; uncleanliness; exposure to cold and damp air.

Most commonly a disease of childhood.

Forms. Acute and chronic.

Pathological Anatomy. *Acute variety;* hyperæmia, swelling, œdema, and softening of the mucous membrane of the lower portion of the small and the upper portion of the large intestines, with hyperplasia of the intestinal follicles, their excretory follicles enlarged and tumid, readily distinguished as grayish or blackish points in the middle of the glands; the patches of Peyer are also enlarged, tumefied, and project above the level of the surrounding mucous membrane, the orifices of the follicles appearing as dark points; these patches often have an ulcerated appearance, but upon closer examination ulcers are not discovered.

Chronic variety; the thickening and infiltration have extended to the submucous and muscular coats, followed by induration of the tissues, so that the walls of the intestines are often abnormally rigid. Ulceration occurs, which extends through the entire thickness of the membrane. "These ulcers, when isolated, are from one to one and a half lines in diameter, oval or circular in shape, and either have sharp-cut edges, as though the piece of mucous membrane had been cut out with a punch, or the mucous membrane bounding them is undermined." The small ulcers often coalesce, so that large, irregular ulcerated patches are formed, having for their base the submucous or muscular coats, and have a grayish-white color.

The mesenteric glands are enlarged, but seldom, if ever, undergo ulceration.

Symptoms. *Acute form;* may develop slowly, with restlessness and fretfulness, or suddenly with *feverishness*, *loss of appetite*, *thirst*, *nausea*, moderate *vomiting*, and abdominal *pain;* or *diarrhœa* may be the first indication of illness. Regardless of the character of the onset, the *stools* should present the characteristic appearance; they are *semi-fluid*, heterogeneous, *greenish*, *acid*, mixed with *yellowish fragments* of ordinary fæces, and *undigested casein*, termed the "chopped spinach" stools. The *abdomen* is *enlarged* and *tender*. An irregular temperature record may occur with increased frequency of the pulse.

Emaciation is marked in proportion to the severity of the symptoms; in marked cases the child is reduced to a condition of the greatest debility within a few days.

Chronic form, or ulcerative entero-colitis, usually follows the acute form, the character of the symptoms being less severe, but decidedly

persistent: the strength fails, the temper is very irritable; the complexion grows dark, sallow, and unhealthy, the skin dry and harsh, and, in consequence of the marked emaciation, either hangs in folds around the shrunken limbs or is drawn tightly over the joints; the abdomen is enlarged and tender, the stools numbering from six to a dozen during the day and night, consisting of the products of an imperfect digestion mixed with mucus, serum, pus, and oftentimes blood, having a semi-fluid consistency, and an extremely offensive odor. Ulcerative stomatitis is a frequent complication adding to the discomfort of the patient. An irregular temperature record may occur with increased frequency of the pulse.

Duration. *Acute form*, from ten days to about two weeks, subsiding gradually; *chronic form*, from one to two or three months, or even longer.

Diagnosis. The acute form can hardly be mistaken for any other condition, if the characteristic stools and other abdominal symptoms are present. The chronic form has been frequently mistaken for the diarrhœa of tuberculosis, an error that can hardly occur if a physical examination of the chest has been made, as well as microscopical examination of the stools.

Prognosis. Always a very serious malady, and proves fatal if it attacks the weak during midsummer, or when surrounded by unfavorable hygienic conditions; in vigorous children, who have passed through their first dentition, the prognosis is quite favorable.

Treatment. For the *acute form*, restricting the amount of food for the first few days is of importance. Fresh, pure air, cleanliness, and rest are also of great importance.

Any one of the following formulæ may be used with advantage.

℞. Salol, ... gr. ij .13 Gm.
Bismuthi subnit., ... gr. v .32 Gm.
Ft. chart.
SIG.—Such a powder every two hours.

Or—

℞. Hydrargyri chlor. mite, ... gr. ss .032 Gm.
Pulv. ipecac., ... gr. ss .032 Gm.
Pulv. opii, ... gr. ss .032 Gm.
Cretæ præparat., ... gr. xx 1.3 Gm. M.
Ft. chart. No. xij.
SIG.—One every two or three hours, to child of one year.

Many cases do well with *pulvis kino comp.*, others with minute

doses, frequently repeated, of *acidum lacticum*, and many others with *bismuthi subnitras*, gr. x–xv (0.6–1 Gm.), in milk, every few hours.

The following is a good combination:

℞. Bismuthi subnit., ... ʒ iij 12. Gm.
Tinct. kino, ... f ʒ iss 45. Cc.
Tinct. opii camphorat., ... f ʒ iss 45. Cc.
Mist. cretæ, ... ʒ iij 90. Cc. M.

Sig.—Tablespoonful every few hours.

Locally, warmth to the abdomen, with mustard, turpentine stupes, or the *spice poultice*, made as follows: *cloves, allspice, cinnamon, and anise seeds*, each half an ounce (15.6 Gm.), pounded (not powdered) in a mortar, and placed between two pieces of coarse flannel about six inches square and quilted in; soak this for a few minutes in hot brandy or hot whisky and water, equal parts, and apply to the abdomen, heating again as it becomes cool.

Chronic entero-colitis. Few conditions will tax the skill and patience of the physician to the same degree.

First and foremost the diet must be carefully regulated. Milk alone, or predigested, or with lime-water, in the majority of cases is the best article of diet. Should it disagree, then recourse must be had to some of the prepared foods, such as Mellin's, Horlick's, Ridge's, Blair's prepared wheat, Liquid Peptonoids, or Eskay's albuminized food, or other prepared foods, often the one agreeing with one patient will not agree with another.

After caring for the diet, then the hygiene of the patient requires attention. Cleanliness, such as daily warm baths, often adding with advantage sea-salt. Rest in bed for an hour or more after meals if the patient cannot be kept continually in bed. The air of the room should be fresh and pure.

Among drugs may be mentioned *bismuthum* and *pepsinum* or *salicinum*. Or—

℞. Argenti nitrat., ... gr. j .065 Gm.
Acid. nitric. dil., ... ♏xv 1. Cc.
Mucil. acaciæ, ... f ʒ ss 15. Cc.
Aq. cinnamomi, ... ad f ʒ iij ad 90. Cc. M.

Sig.—Teaspoonful, diluted, every three or four hours.

Or—

℞. Acidi carbolici, ... gr. $\frac{1}{12}$–$\frac{1}{8}$ .005–.008 Gm
Tincturæ iodi, ... ♏j–ij .06–.12 Cc.
Aquæ menthæ, ... f ʒ j 4. Cc. M.

Sig.—Every three or four hours.

Or—

℞. Tinct. calumbæ, ... f℥iij 12. Cc.
Liq. ferri nitratis, ... ♏xxx 2. Cc.
Syrupi zingib., ... q. s. ad f℥iij ad 90. Cc. M.

SIG.—One or two teaspoonfuls, according to age, every three or four hours, diluted.

Or—

℞. Quininæ muriat., ... gr. xxv 1.6 Gm.
Acid. tannici, ... gr. x .6 Gm.
Syr. limonis, ... f℥ij 8. Cc.
Aq. chloroformi, ... ad f℥iij ad 12. Cc. M.

SIG.—Teaspoonful every two hours.

CHOLERA INFANTUM.

Synonyms. Choleriform diarrhœa; summer complaint.

Definition. An acute catarrhal inflammation of the mucous membrane of the stomach and intestines, together with an irritation of the sympathetic nervous system, occurring in children during their first dentition; characterized by severe colicky pains, vomiting, purging, febrile reaction, and prostration.

Cause. Age. There is no other disease of the intestinal canal showing the evidence of *infectious* origin so strongly as typical attacks of cholera infantum. Bad hygiene, or, as it is now entitled, "civic malaria"; continuous high temperature; improper food; dentition; constitutional, as in the feeble, delicate, nervous, or irritable.

Pathological Anatomy. Resembles closely, if not identical with, the phenomena of catarrhal gastritis and enteritis, together with a powerful irritation of the fibres of the sympathetic nervous system.

Symptoms. The onset is *sudden* in a child previously well, or in a child suffering from a bowel affection.

Begins with *vomiting*, *purging*, abdominal *pain*, *fever*, *rapid pulse*, and *intense thirst.*

The *vomited matter* is partly digested food, sero-mucus, and finally bilious, and is accompanied with distressing *retching*. The *thirst* is a marked phenomenon of the disease, and ice and water will be taken incessantly, although rejected only a few moments after.

The *stools* are first partly fæcal, but soon watery or serous, soaking

the clothing, leaving a faint greenish or yellowish stain; their odor is musty, at times fetid; their number is from ten to twenty in the day. *Pains* precede the vomiting and purging, colicky in character.

The *fever* begins at once, the temperature varying from 101° to 105°, with morning remissions. The *pulse* is rapid and feeble, ranging from 130 to 160 beats.

These symptoms continue but a few hours, before *rapid wasting* ensues, the body shrinks, the eyes are sunken and partly closed, the mouth partly open, the lips dry, cracked, and bleeding. The child, at first *irritable* and *restless*, passes into a semi-comatose condition, the pulse becoming more and more feeble; the surface has a clammy coldness, the contracted pupils not responding to light, and the stupor deepens, death soon following, or the symptoms slowly ameliorate, convalescence being slow and tedious.

Diagnosis. The *entero-colitis* or inflammatory diarrhœa of childhood is constantly being mistaken for cholera infantum. The symptoms of the former are: gradual onset, with *fretfulness*, *loss of appetite*, *feverishness*, *nausea*, and moderate *vomiting*, soon followed by *diarrhœa*, the stools being semi-fluid, greenish, mixed with yellowish particles of fæces and undigested casein, with a sour odor, the "chopped spinach" stools, the *abdomen* distended and *tender*, moderate *fever* and *thirst*, and having a *duration* of about two weeks.

Prognosis. Difficult to predict the result, and so care must be exercised in giving a prognosis. The duration of the choleraic symptoms is short, under five days, but relapses are common, and the sequelæ are protracted.

Treatment.—The result of any mode of treatment for true cases of cholera infantum is unsatisfactory. Holt urges attention to the toxic nature of the disease, and suggests following indications for treatment: Empty stomach and intestines by stomach washing and intestinal irrigation; neutralize the cardiac and nervous poison by hypodermics of morphia and atropia; supply the fluid drain by hypodermoclysis of normal salt solution, and its intestinal use, and reduction of temperature by the graduated cooling bath and ice-cap to the head and bold stimulation. Change of air of the greatest benefit. Restricted diet, and particularly for first few days, using *brandy*, ♏v–x (0.3–0.6 Cc.), in *barley water* at hourly intervals.

For the *vomiting*, large doses of *bismuthum;* or *chloral*, gr. j–iij

(0.065–0.21 Gm.), by mouth in demulcent, or double the amount by the rectum, or one of the following:

℞. Bismuth. subnit., ... ʒij 8. Gm.
Acid. carbolici, ... gr. j .065 Gm.
Mist. acaciæ,
Aq. menth. pip., ... āā fʒj āā 30. Cc. M.
Sig.—Teaspoonful every half-hour, hour, or two hours.

Or—

℞. Hydrargyri chlor. mit., . . . gr. $\frac{1}{20}$ .003 Gm.
Bismuth. subnit., ... gr. ij–v .13–.3 Gm. M.
Sig.—A powder every half hour.

Good results are reported from *bismuthi salicylas*, gr. ij (0.13 Gm.), with sugar of milk every hour or two, or *salol*, gr. j–ij (0.065–0.13 Gm.), every two or four hours.

If the fever is high, sponging with alcohol and water, the cold pack, or the cool bath can be used first, gradually reducing its temperature, and afterwards using stimulants.

For *depression*, regulated nursing, and feeding every two hours, and water or ice to quench the intense thirst, and *cognac brandy*, ♏v–x (0.3–0.6 Cc.), every hour or two, in water, by mouth or in warm enema.

Locally: over epigastrium, mustard or a spice poultice, or turpentine stupes.

If the *nervous symptoms* become aggravated, small dose of *potassii bromidum* or *valerian*, which "reduces the reflex excitability, motility, and sensibility," is indicated.

ACUTE DYSENTERY.

Synonyms. Colitis; ulcerative colitis; bloody flux.

Definition. An acute inflammation of the mucous membrane of the large intestines; either catarrhal or croupous in character, followed in some cases with ulceration, characterized by fever, tormina, tenesmus, and frequent, small, mucous, and bloody stools.

It occurs either *sporadically*, *endemically*, or *epidemically*.

Four clinical forms are described: acute catarrhal; amœbic or tropical; croupous or diphtheritic; chronic dysentery.

Causes. *Sporadic*, *endemic*, or *catarrhal* dysentery prevails most extensively in the summer and early autumn months. All forms of colitis are of bacterial origin. Sudden atmospheric changes, such as hot days and cool nights. Malaria has some connection with its causation. Errors in diet not a cause. The drinking water may be the means by which the poison gains entrance to the system.

Amœbic or *tropical dysentery*, characterized by the presence in the stools of the *Amœba coli* (Lösch) or *Amœba dysenterica* (Councilman and Lafleur). This variety is often epidemic in the tropics.

Croupous or *diphtheritic dysentery* is often epidemic; frequently occurs as a terminal event in acute and chronic diseases. The causes are much those of the acute catarrhal form, acting upon a depressed system. The *Amœba coli* may be seen in the stools.

Dysentery is not contagious, but is infectious.

Pathological Anatomy. *Catarrhal dysentery;* congestion, swelling, and œdema of the mucous membrane and submucous tissue of the large bowel, with an over-production of mucus; the follicles are enlarged, from retention of their contents, the result of the swelling; the congested vessels often rupture; the mucous membrane softens in patches, and is detached, forming ulcers. Recovery follows, if the destruction of tissue is small, smooth cicatrices, minus gland structure, marking the site.

Amœbic or *tropical dysentery*, the lesions are also in the large intestines and sometimes in the lower portion of the ileum. Abscess of the liver is a frequent complication.

"The lesions consist of ulceration, produced by preceding infiltration, general or local, of the submucosa, the general infiltration being due to an œdematous condition, the local to multiplication of the fixed cells of the tissue. In the earliest stages these local infiltrations appear as hemispherical elevations above the general level of the mucosa. The mucous membrane over these soon become necrotic and is cast off, exposing the infiltrated submucous tissue as a grayish-yellow, gelatinous mass, which at first forms the floor of the ulcer, but is subsequently cast off as a slough." (Osler.)

Croupous or *diphtheritic dysentery* begins with intense congestion, swelling, and œdema of the mucous and submucous tissue, with extravasations of blood and the whole mucous membrane covered with a firm, fibrinous exudation; the mucous membrane softens and sloughs, leaving large ulcers and gangrenous spots. If recovery

occur, large cicatrices form, which narrow the calibre of the intestinal tube.

The mesenteric glands enlarge, soften, and abscesses form in them; the liver becomes the seat of small abscesses, from embolic obstruction of the radicles of the portal vein; the heart muscles are flabby and more or less fatty.

Symptoms. *Catarrhal form* begins gradually, with *diarrhœa*, *loss of appetite*, *nausea*, and *very slight fever*, which continues for two or three days, when the *true dysenteric* symptoms develop, to wit, *pain* on pressure along the transverse and descending colon, *tormina* or *colicky pains* about the umbilicus, *burning pain* in the rectum, with the sensation of the presence of a foreign body and a constant desire to expel it, or *tenesmus;* the *stools* for the first day or two contain more or less fæcal matter, but they soon change to a *grayish*, *tough*, *transparent mucus*, containing more or less *blood* and *pus;* during the *tormina*, *nausea* and *vomiting* may occur; the urine is scanty and high-colored; the number of stools varies from five to twenty or more in the twenty-four hours.

The *duration* is about *one week*, the patient being much *emaciated* and *enfeebled*.

Amœbic form begins gradually as the catarrhal form, or gradually as an increasing diarrhœa. Soon the *stools* become characteristic of the variety of the attack, being *frequent*, *bloody*, *mucoid*, but *very fluid;* as the disease progresses, the stools become *yellowish-gray* and *liquid*, containing mucus, sometimes bloody. The number of stools varies from six to a dozen or more in a day. Actively moving *amœbæ* are found in the stools, disappearing as the stools become formed. *Fever* may or may not be present, or may come and go. Abdominal *pain* and *tenesmus* are present in the majority of cases.

The loss of flesh and strength is marked. Abscess of liver and lungs are frequent and grave complications.

Duration from six to twelve weeks; recovery tedious, owing to anæmia and loss of flesh.

In every endemic or epidemic of dysentery a number of *amœbic* cases will occur. During the past three years I have seen probably two hundred cases of dysentery, beginning as catarrhal, but in the midst of the endemic a number of amœbic cases occurred, the convalescence long outlasting the catarrhal variety.

The *croupous* or *diphtheritic form* sets in suddenly, the *stools* being

more frequent, containing more *blood* and *pus*, with *patches of membrane*, even *casts of the bowel*, together with more or less *gangrenous mucous* membrane; *nausea*, *vomiting*, and great *prostration*, *cold skin*, *feeble pulse*, and *emaciation* with *anxious expression*, the *odor* surrounding the patient being *fetid*.

The occurrence of this form as a termination of Bright's disease, lung and heart diseases, must be borne in mind.

The *duration* of the grave symptoms is three or four days, when collapse and death occur, or slow convalescence begins, continuing for weeks.

Chronic Dysentery. This is really a continuation of the acute disease, the symptoms continuing the result of the ulcerated mucous membrane, or the cystic degeneration of the glandular elements of the large gut (Woodward). Rarely, dysentery develops subacutely, and thus is almost chronic from the beginning. There is seldom a characteristic stool, little colicky pain, and little or no tenesmus, but a progressive loss of flesh with loose bowels, the stools containing mucus, little or no blood, undigested food, and are frothy. The number varies from two to a dozen in a day. Acute exacerbations are frequent. Duration, often months or years.

Complications. Peritonitis; hepatic abscesses; phlebitis of the intestinal veins; intestinal perforation.

Diagnosis. *Enteritis* lacks the tenesmus and characteristic stools.

Peritonitis, when idiopathic, shows higher temperature, greater tenderness, and constipation.

Chronic dysentery is difficult to distinguish from chronic diarrhœa.

Prognosis. *Catarrhal* form favorable, save in those debilitated.

Amœbic form: the mortality is higher than in catarrhal form, and in favorable cases the convalescence is slow.

Croupous form: the prognosis is always grave, for if recovery does occur, the bowel may be crippled from loss of structure, or from narrowing of its calibre, the results of cicatrices.

Treatment. Keeping in mind the following dictum of Osler, no case of dysentery, however mild, should be lightly considered: "Dysentery is one of the four great epidemic diseases of the world. In the tropics it destroys more lives than cholera, and it has been more fatal to armies than powder and shot."

The patient should be confined to bed in even the mildest attack, and the stools removed at once and *disinfected*. In fact the bed-pan

or other vessels should constantly contain a solution of *ferrous sulphate* (copperas) sufficient to cover the expected stool.

The diet to be of the most nourishing yet bland character, adding stimulants if much prostration.

The most frequently used drug, and in many cases by far the best, is *opium*, alone or combined with one or more astringents:

℞.	Ext. opii, ...	gr. ss	.032 Gm.
	Plumbi acetat., ...	gr. ij	.13 Gm.

Every two hours.

Or—

℞.	Pulv. opii, ...	gr. ss	.032 Gm.
	Plumbi acetat., ...	gr. ij	.13 Gm.
	Pulv. ipecac., ...	gr. ¼	.016 Gm.

Every two hours, until character of stools change.

I have frequently seen the character of the stools change within twenty-four hours with the following, which I call *Mistura enterica*, viz.:

℞.	Acid. sulph. dil., ...	f℥ ss	15. Cc.
	Tinct. opii deodorat., ...	f℥ j	30. Cc.
	Spts. camphoræ, ...	f℥ j	30. Cc.
	Tinct. capsici, ...	f℥ ss	15. Cc.
	Spts. chloroformi, ...	f℥ ss	15. Cc.
	Spts. vini gallici, ...	f℥ iss	45. Cc.

Sig.—One teaspoonful every two or three hours, diluted.

In more than one instance I have seen a severe attack of acute dysentery succumb to *morphinæ sulphas*, gr. ¼–½ (0.016–0.032 Gm.), three or four times daily hypodermically, within three or four days. For the intense tormina and tenesmus no remedy is comparable with morphia by the hypodermic method.

In strong young individuals the very best prescription possible is—

℞.	Magnesii sulph, ...	℥j	4. Gm.	
	Acid. sulph. dil., ...	♏x	.6 Cc.	
	Tinct. opii deodorat., ...	♏x	.6 Cc.	
	Aquæ chloroformi, ... ad	℥ij	ad 8. Cc.	M.

Every two or three hours, until fæces appear in the stools, when small doses of *opium* and *quininæ sulphas* may be used.

Bismuthi subnit., gr. xxx (2 Gm.), every two or three hours, or

bismuthi salicylas, gr. xx (1.3 Gm.), every two or three hours, are often successful.

Dr. Loomis speaks strongly of *ipecacuanha*, gr. ¼ (0.016 Gm.), every half-hour, with sufficient opium to secure quietness. The large doses of ipecacuanha recommended I have had no experience with.

Ringer recommends *hydrargyri chloridum corrosivum*, gr. $\frac{1}{100}$ (0.00065 Gm.), every hour or two, which "rarely fails to free the stools from blood and slime, although in some cases a diarrhœa of a different character may continue for a short time longer."

In children the following combination is successful:

℞. Pulv. ipecacuanhæ, ...	gr. ¼	.016	Gm.
Bismuth. subnit., ...	gr. v–x	.32–.65	Gm.
Cretæ præp., ...	gr. iij	.2	Gm. M.

Sig.—Every two hours.

Washing out the rectum with either tepid, hot, cold, or iced water, as suggested by Prof. Da Costa, adds greatly to the patient's comfort and to the decrease of the inflammatory process. Ice suppositories are soothing and relieve the tenesmus and rectal pain.

A one or two per cent. solution of *creolin* (one-half pint) as an enema often rapidly lessens the number of stools and the tenesmus. Dr. H. C. Wood recommends iodoform suppositories.

"In the cases of amœbic dysentery we have been using at the Johns Hopkins Hospital, with great benefit, warm injections of quinine in strength of 1 to 5000, 1 to 2500, and 1 to 1000. The amœbæ are rapidly destroyed by it." (Osler.)

I have met over five hundred cases of acute dysentery during the past six years, and have nearly always been successful with *nuclein*-Aulde, gr. j (0.065 Gm.), or ♏j–v (0.06–0.3 Cc.), every hour until the character of the stools change, when the interval of the dose is widened to two or three hours and bismuthum or the foregoing mistura enterica added.

Locally, poultices, stupes, and the water bag do no good, but if they are agreeable to the patient they may be allowed, as they do no harm.

Chronic dysentery. A carefully selected but nourishing diet, change of scene, and some of the following remedies: *Bismuthum subnitrat.*, gr. xxx (2 Gm.), t. i. d.; *terebinthina*, ♏x (0.6 Cc.), every three or four

hours; *argenti nitras*, gr. ⅛–⅓ (0.008–0.022 Gm.), three or four times daily; or ℞. *Cupri sulphas*, gr. ⅙ (0.011 Gm.); *ext. opii*, aq., gr. ¼–½ (0.016–0.032 Gm.); *ext. nucis vomicæ*, gr. ⅙ (0.011 Gm.), in pill, four times daily.

Chronic dysentery is sometimes protracted by a trifling patch of inflammation or ulceration in the rectum or sigmoid flexure, or a relaxed condition of the mucous membrane of the rectum, and of the hemorrhoidal vessels. There occur two or three loose stools in the morning, a mucous dysentery, and then a comparatively comfortable day. The stools are preceded by some colicky pain across the lower part of the abdomen and in the line of the large bowel. The general condition, other than the anæmia and weakness, of the patient is good. Drugs by the mouth are useless to control these cases; the medication must be made directly to the diseased part. Injections of *argenti nitras*, gr. v to xx or xxx (0.32–1.3–2 Gm.), to the pint, are curative; the silver may be combined with opium (℞. Argent. nitrat., gr. j (0.065 Gm.); tinct. opii deodorat., ♏xv (1 Cc.); aquæ amyli, fʒiv (120 Cc.); M.).

During the convalescence from all varieties of dysentery, tonics are indicated (℞. Strychninæ sulph., gr. ½ (0.032 Gm.); acid hydrochlorici dil., fʒij (8 Cc.); tinct. gentian comp., q. s. ad fʒiv (120 Cc.); M. S.—One teaspoonful before meals in water. A course of *oleum morrhuæ* with *syr. calcii lactophosphatis*, should be used if much emaciation.

TYPHLITIS.

Synonyms. Inflammation of the cæcum; typhlitis stercoralis.

Definition. A catarrhal inflammation of the mucous membrane of the cæcum and ascending colon; characterized by pain, tenderness, constipation, and in certain cases a characteristic vomiting.

Causes. I do not believe the term "typhlitis" is to be supplanted by the term appendicitis; I am convinced there are two conditions having some symptoms in common. In a majority of instances typhlitis is *mechanical*, due to the accumulation of fæces in the cæcum.

Pathological Anatomy. Similar to the catarrhal inflammation of dysentery.

Symptoms. *Pain* and *tenderness* in the right iliac fossa and

along the ascending colon, with some *pominence* of this region; the *bowels* are distended with gas (*meteorism*) and are usually *constipated*, or small liquid stools may occur from time to time, due to the accumulation of hardened fæces in the sacculated periphery of the cæcum, leaving a central canal through which the liquid contents of the upper bowel can pass.

In *severe cases*, "the local *pain*, *tenderness*, and *swelling* are greater; there are *impaction* of *fæces* and *no movements or flatus*. There are decided *fever*, *restlessness*, and also *nausea* and *vomiting*. The *vomited matters*, at first the contents of the stomach, then of the duodenum, with bilious matter, and ultimately, if the impaction persists, of material having the odor of fæces. With these symptoms occur *great depression of the vital powers*. *Peritonitis* is finally developed by contiguity of tissue or by rupture of the bowel."

The *temperature* in even mild cases is one or two degrees above the normal and in a fair number an *eruption* is seen upon the abdomen, consisting of one or two dark-red spots the size of a pin-head, which are of short life and disappear on pressure.

Duration. The *mild form* lasts about one week. The *severe form* may terminate in subacute peritonitis, continuing about two weeks.

Diagnosis. The *mild form* is distinguished from other intestinal affections by the localized pain, tenderness, and prominence, and the constipation.

The *severe form* can only be distinguished from the other forms of *intestinal obstruction* by the history of the case and attack, and the results of treatment.

Prognosis. *Mild form* favorable. *Severe form* grave, although not necessarily fatal.

Treatment. The patient should be kept in bed, and placed on a strictly milk diet in very limited amounts.

Two indications are to be met, which are seemingly opposed to each other: *first*, the removal of the accumulation of fæces, which in the majority of cases has caused and still maintains the inflammation; *second*, to retard the inflammation resulting from the presence of the fecal mass.

If the pain and suffering be intense, at once administer a hypodermic injection of *morphinæ sulphas*.

The two indications above named are met by the use of the following:

℞.	Magnesii sulph., ...	℥ xij	48.	Gm.	
	Acid. sulphurici dil., ...	f℥ ij	8.	Cc.	
	Tinct. opii deodorat., ...	f℥ iv	15.	Cc.	
	Spts. chloroformi, ...	f℥ ij	8.	Cc.	
	Aquæ menth. pip., . . q. s. ad	f℥ iij	ad 90.	Cc.	M.

Sig.—One teaspoonful every hour, diluted.

If it be true that calomel has a specific action upon the lower portion of the small bowel, increasing the secretion from the glands located there, then the following should be useful:

℞.	Hydrargyri chlor. mite, . . .	gr. ij	.13	Gm.
	Sodii bicarb., ...	gr. xx	1.3	Gm.
	Sacc. lac., ...	gr. xxx	2.	Gm.

Ft. chart. No. x.

Sig.—One every hour till twelve taken, followed by *hot* Hunyadi Janos water or other saline purgatives.

In *severe cases*, begin an *opium* influence at once, by hypodermic injections of *morphinæ sulphas* guarded with *atropinæ sulphas*, continued until all symptoms of inflammation have subsided, when attempts to remove the accumulated fæces may be made by *irrigation of the bowel* with warm soapsuds, and the cautious administration of *magnesii sulphas* in drachm doses, every two hours.

Locally, hot, dry applications, or the ice bag.

PERITYPHLITIS—APPENDICITIS.

Synonyms. Perityphlitic abscess; suppurative appendicitis; pericæcal abscess; iliac abscess.

Definition. *Perityphlitis;* an acute inflammation of the connective tissue around the cæcum (with localized peritonitis) leading to the formation of an abscess.

Appendicitis. An acute or subacute inflammation of the appendix vermiformis, involving the surrounding tissues (with a localized peritonitis), leading to perforation of the appendix and the development of an abscess.

Causes. The frequency with which appendicitis is met with has

led to the belief that the condition is of germ origin, the exact nature of which not having been determined. The great majority of cases of perityphlitis are secondary to inflammation of or perforation of the vermiform appendix—appendicitis. Have seen two cases of true perityphlitis, the result of exposure to cold and wet.

Appendicitis may result from the presence of a foreign body in its canal, consisting of inspissated fæcal masses, which, becoming incrusted with lime salts, are termed "fæcal calculi," and becoming rounded in shape closely resemble a cherry-stone, for which they have been mistaken. Foreign bodies, particularly seeds of fruit, sometimes, but not so often as is believed by the laity, gain access to the appendix and produce inflammation leading to perforation. Torsion of the appendix is also among the infrequent causes. The disease is more common in males than females. Occurs most frequently between the ages of ten years and thirty years. Relapses are fairly frequent in cases not progressing to perforation.

Some one has suggested the increased frequency of appendicitis since the reappearance of influenza.

Symptoms. The symptoms of the two conditions are much alike; begins with a *feeling* of *weight*, *soreness*, and rapidly developing and *severe pain* in the lower right abdomen (McBurney's point), accompanied with *nausea* and vomiting. The pain is increased by lying on the left side; the right leg is flexed, the *abdomen* becomes *tense*, *prominent*, and *tender*, with the progressive development of a *hard swelling* in the right *iliac region*. The *temperature* at the onset is from 90°–100°, and may or may not be preceded by a chill; the *pulse* 80, full and strong; the tongue coated with red tips, the bowels costive. In addition to the persistent, localized pain, occurs severe colicky paroxysms, which may shoot into the hip and thigh. The expression of the patient is pinched and denotes suffering. The special tendency of the disease is toward *suppuration*, which is announced by *irregular chills*, *feverishness*, the temperature shooting suddenly to 101°–103°, and *sweats;* and a feeling of *tension* and *throbbing*. Its development is slow, and if associated with *typhlitis* the symptoms of that affection are added.

Complications. Perforation of the appendix. Local or general peritonitis.

Diagnosis. Differs from *typhlitis* by the absence of the colicky pains, dyspeptic symptoms, costive bowels, and tympanites preceding

the development of a tumor; in perityphlitis the tumor is present with the development of the symptoms.

Psoas abscess is not associated with intestinal symptoms, and the discharge is free from a fæcal odor. *Renal* and *ovarian* tumors should not be sources of error. The possibility of hernial tumors must not be overlooked.

Treatment. If not associated with typhlitis, the treatment is to allay the inflammation in the first stage, by either *ice, locally*, or freely *painting* with *tinctura iodi;* if suppuration is evident, surgical measures are the indication, medical treatment endangering life.

PROCTITIS.

Synonyms. Catarrh of the rectum; dysentery; rectitis.

Definition. A catarrhal inflammation of the mucous membrane of the rectum and anus; characterized by pain, tenesmus, and frequent stools of hardened fæces, or of mucus, pus, and blood.

Causes. Chief cause, constipation; also sitting on damp ground or stone steps; habitual use of enemata or purgatives; diseases of the liver; hemorrhoids.

Pathological Anatomy. Similar to those occurring in catarrhal dysentery.

Symptoms. Uneasy sensation and *burning in the rectum*, with a constant desire for stool, or *tenesmus*, often so severe as to cause a *prolapse of the mucous membrane. The stools* may be either *hardened fæces* or *scybala* from the distended colon, which cause *intense pain* when they reach the rectum; or *the stools* may be of *mucus, muco-pus*, or *bloody or blood-streaked.* Generally there are present *nausea*, especially during the tenesmus, *headache, feverishness*, and *malaise.* In severe cases there is *strangury*, and, with the tenesmus, *straining with urination.*

If the case be protracted and severe, inflammation of the connective tissue around the rectum occurs, causing *periproctitis*, which usually terminates in various kinds of fistulæ.

Complications. Periproctitis; peritonitis; hepatic abscesses.

Diagnosis. In *males*, the disease cannot be confounded with any other affection, save, perhaps, hemorrhoids. In *females*, displacements of the uterus may somewhat simulate the symptoms of proctitis.

Prognosis. Uncomplicated cases favorable. Either of the complications adds greatly to the gravity of the affection.

Treatment. In cases due to constipation the chief indication is to empty the bowels, using an enema of warm water and soap or *magnesii sulphas :*

℞. Magnesii sulph., ...	℥ij	60.	Gm.	
Glycerini, ...	f℥ss	15.	Cc.	
Aquæ bul., ...	f℥iv	120.	Cc.	M.

Irrigation of the *bowel* with warm water once or twice daily assists in the liquefaction of the hardened fæces. Either enemata or suppositories of *glycerinum* should answer in certain cases.

Cases other than those due to constipation, *emollient enemata* and *opium*, one of the best being—

℞. Ol. olivæ, ...	f℥ij	60.	Cc.
Tinct. opii deodorat., ...	♏xv	1.	Cc.

The use of *hot injections* of an astringent character, such as hot, strong black coffee, from half-pint to quart, as hot as will be tolerated by the rectum, as suggested by Dr. Pepper, is valuable in cases of irritable rectum with a disposition to looseness. In cases not benefited by the hot injections, relief may follow the use of injections of water, say two ounces, as cold as can be borne without chilling, administered at bedtime, having it retained.

If symptoms of *periproctitis* occur, use *ice* to the parts, and if suppuration ensue, *evacuation* by a free opening and *quininæ sulphas.*

INTESTINAL OBSTRUCTION.

Synonyms. Intestinal occlusion; strangulated hernia; invagination; intestinal stricture; ileus.

Definition. A sudden or gradual closure of the intestinal canal; characterized by pain, nausea, vomiting, constipation, and finally collapse.

Causes. The numerous causes are arranged as follows :

1. *Accumulations within the bowel* of hardened fæces, or foreign bodies.

2. *Strictures* the result of cancer, ulceration, or cicatrices.

3. *Pressure against the bowel*, from peritoneal adhesions, tumors, and abnormal growths.

4. *Strangulations*, due to the numerous forms of hernia.
5. *Invagination* or intussusception, the most common.
6. *Twisting*, volvulus or rotation of the bowel.

Pathological Anatomy. *Invagination* is the form calling for special description here. It is usually caused by the lower portion of the ileum slipping down into the cæcum, as the finger of a glove might be invaginated, causing thus an actual mechanical obstruction; this is produced by a spasm of the ileum, whereby its calibre is greatly diminished, thus permitting its descent into the lower bowel. Resulting from this occlusion or compression, are congestion, inflammation, with secondary constitutional reaction and death, or more rarely the invaginated bowel sloughs off and is voided by stool, union taking place at its site and recovery following.

Symptoms. The onset of the symptoms may be either *sudden* or *gradual*, and are as follows:

Constipation, with more or less severe *colicky pains*, not relieved by either purgatives or injections; *feeling of weight* and *soreness*, with *distention* of the abdomen from retained gas, and *nausea* and *vomiting;* the symptoms all grow more pronounced, the *pain* becoming *violent, tenderness* in limited areas, the *vomiting* becoming *stercoraceous*, the abdomen hard and tense, the *eyes sunken*, the *pulse quick* and *feeble*, the *skin cold* and covered with a clammy sweat. Absence of escaping flatus is a valuable diagnostic symptom. The above continue more or less pronounced for a week or ten days, when collapse and death occur, or more rarely there is a gradual return to health.

Cases occur rarely in which small, fæcal, muco-purulent stools containing more or less blood exist, instead of constipation.

Diagnosis. One of the most difficult, and can only be solved by a careful study of the case along with the different causes producing the affection. The sight of the occlusion can rarely be determined positively, unless the X-ray be successful.

Intestinal obstruction may be mistaken for intestinal colic, hernia, enteritis, peritonitis, hepatic or renal colic.

Prognosis. Always grave, but guided by the cause. *Impacted fæces* favorable. *Invagination* less favorable, but recoveries occur; the longer the symptoms continue, the more favorable the outlook. *Strangulations* unfavorable, but many recoveries recorded. *Strictures* due to cancer, cicatrized ulcers, and the like, are the most unfavorable.

Treatment. Stop all forms of purgatives as soon as the diagnosis of obstruction is determined.

Opium is indicated in all forms with pain, and is best administered in the form of *morphinæ sulphas*, combined with small doses of *atropinæ sulphas*, hypodermically.

The author has seen the most brilliant results follow the plan of *washing out the stomach* as suggested by Küssmaul, and with full doses of *atropinæ sulphas* hypodermically, for its action on intestinal peristalsis, and with electricity, one pole over abdomen, the other in rectum.

Cases resulting from *impacted* fæces are rapidly cured by the above plan combined with *irrigation* of the lower bowels with tepid soap-suds or a high enema of glycerinum and magnesii sulphas.

If *invagination*, raising the buttocks and lowering the chest, and repeated *injections* of *warmed oil*, are recommended, or have the abdomen opened and the invagination reduced.

Distention of the bowel by *pumping air* through long rectal tubes, or disengaging *carbonic acid gas* in the bowel, by first injecting a solution of *sodii bicarbonas*, and follow this with a solution of *acidum tartaricum*, about one drachm (4 Gm.) of each, pressure being made against the anus to prevent escape; but the danger of rupture of the bowel must not be overlooked.

Flatulent distention can be removed by the long *aspirator* needle.

Laparotomy is no doubt the operation of the future, when our means of diagnosticating the location of the trouble is more exact.

The *nutrition* of the patient is best attained by injections of either peptonized foods or defibrinated blood, or both.

INTESTINAL PARASITES.

TAPEWORMS.

Varieties. *Tænia solium; Tænia saginata; Bothriocephalus latus.*

Causes. The *Tænia solium*, the "armed tapeworm," is the most common in this country. It is derived from the embryos contained in *pork*, known as the *cysticercus cellulosus.*

The *Tænia saginata*, the "unarmed tapeworm," a not uncommon variety, is derived from the embryos contained in *beef*, known as *cysticercus bovis*.

The *Bothriocephalus latus*, also an "unarmed tapeworm," the largest parasite infesting man, is supposed to be derived from an embryo found in *fish*.

The embryo or ovum is introduced into the intestinal canal with the food and drink. The parasite reaches its final growth after its entrance into the intestines.

Those handling fresh meats or eating uncooked animal food are most liable to be affected.

Uncleanliness is also an important factor.

Description. The *tænia solium* is from six to thirty feet in length, has a globular head, or scolex, a slender neck connecting its numerous *flat segments* or *joints*. The head, or scolex, measures about $\frac{1}{40}$ of an inch, has a double circle of hooklets,—whence the term "armed tapeworm,"—and is provided with from two to four suckers. The segments or joints (*strobila*) are flat, and vary from one-eighth to one-half of an inch in length, and each contains both male and female sexual organs, the uterus being a long, numerously branched tube, in which the ova develop; the ova measures about $\frac{1}{1700}$ of an inch in diameter. An ordinary tapeworm contains some five million ova.

The parasite is firmly embedded in the mucous membrane of the upper third of the small intestines by its hooklets and suckers.

The lower or terminal *segments* represent the adult and complete animal, and are termed the *proglottides*, which separate from the parasite and are discharged either alone or with the fæces.

The *tænia saginata* is from ten to forty feet in length, has a rounded or oval-shaped head, measures about $\frac{1}{10}$ of an inch, and has four strong and prominent suckers, but *no* hooklets,—whence the term "unarmed tapeworm"; the neck is short and thick and the *segments* are larger, stronger, and thicker than those of the tænia solium.

The *Bothriocephalus latus* is the largest of the three Cestoda, the length ranging from fifteen to sixty feet, the head oval, measuring about $\frac{1}{10}$ of an inch, a short neck, the segments or joints being nearly three times as broad as they are long. Its color is a dull, bluish-gray. Zoölogically considered, this variety is not a true tapeworm.

Symptoms. Not unfrequently a *tænia* produces no symptoms whatever.

Usually, however, there are *colicky pains* throughout the abdomen, *inordinate appetite*, *disorders* of *digestion*, *emaciation*, *constipation*, attacks of *cardiac palpitation*, *faintness*, disorders of the special senses, and *pruritus* of the anus and nose. Any or all of these symptoms may be present.

A large meal will often remove the majority of the symptoms present.

In a large number of cases the discovery of the *segments* is the first intimation of the presence of the parasite.

Treatment. A number of remedies—termed tæniafuges—are used more or less successfully for the expulsion of the tapeworm.

The very best of these remedies is undoubtedly *oleoresinæ aspidii*, fʒss (2 Cc.), repeated or in the following combination:

℞. Oleoresinæ aspidii, ... fʒij 8. Cc.
Chloroformi, ... fʒij 8. Cc.
Olei tiglii, ... mv .24 Cc.
Glycerini, ... fʒij 60. Cc. M.
Sig.—Take half at 8 A. M.; the rest in an hour if needed (Dock).

The other tæniafuges often successful are: *extractum granati rad. cort. fluidum*, fʒss–ij (2–8 Cc.), or a *decoctum granati rad. cort.* (ʒij—60 Gm.—bark of root, aquæ Oj—480 Cc.), wineglassful every hour until all is taken, as suggested by Prof. Bartholow; or *oleum pepo express.*, fʒj–iv (4–15 Cc.), followed by *oleum ricini*. *Creosotum* has been successful in a number of cases. Several cures are reported from *glycerinum*, fʒij–fʒj (8–30 Cc.), repeated p. r. n.

A much pleasanter remedy is *pelletierine*, the active constituent of *granatum*, used in the form of the *tannate*, gr. x–xx (0.65–1.3 Gm.), or *Tanret's solution of pelletierine*.

An important precaution in the management is close attention to the "preparatory treatment" rendered essential to remove the mucus in which the *head* (scolex) is embedded. It consists in the administration of a thorough purgative for one or two days, and a light diet, such as milk and broths, preceding the use of the tæniafuge.

ROUND WORMS.

Varieties. *Ascaris lumbricoides ; Oxyuris vermicularis.*

Causes. The *ascaris lumbricoides* is one of the most common of the parasites affecting the human family, and develops in the intestines, either after the entrance of the *ova* of the same, or from the so-called "intermediate parasites." Their entrance is effected by means of the food and drink.

The *oxyuris vermicularis* develops in the large intestines, from either its peculiar ova or the so-called "intermediate parasite," these finding their way into the bowel with the food and drink, or by direct contact.

Description. The *ascaris lumbricoides*, or the *round worm*, is of a brownish color, a cylindrical *body*, from ten to twenty inches in length, and from an eighth to a fourth of an inch in circumference ; the *head* terminates in three semilunar lips, each having about two hundred teeth. The *ova* are oval-shaped, are produced in immense numbers, some sixty million in a mature female, have wonderful vitality, resisting extreme heat or cold.

The *round worm* inhabits principally the *small intestines*, although it often migrates to other parts. They are found in numbers from one to several hundred.

The *oxyuris vermicularis*, *thread*, or *seat worm*, resembles an ordinary piece of white thread, measuring from a sixth to a half inch in length, the *head* terminating in a mouth with three lips, the *tail* terminating as a sharp point. The *ova* are oval, produced in large numbers, each female containing about ten thousand, and are surrounded by a stout envelope, which increases their vitality.

The *seat worm*, as its name indicates, inhabits the *large* intestines, especially the rectum, although they frequently migrate to the sexual organs. They vary in number, sometimes the parts frequented being entirely covered.

Symptoms. The *ascaris lumbricoides*, or *round worm*, may be present in great numbers and yet produce no characteristic symptoms other than *gastric* and *intestinal irritation*, causing picking the nose, foul breath, colicky pains, nausea and vomiting, diarrhœa, and disturbed sleep, such as tossing from side to side of bed and grinding the teeth. Any or all of these symptoms may be present or absent; a positive diagnosis is only possible upon the passage of the parasite.

The *oxyuris vermicularis*, or *seat worm*, produces *intense itching* about the anus, with a desire for stool, the passages often containing much mucus, the result of the irritation produced by their presence. Should they migrate to the sexual organs, intense itching of these parts results, which, unless speedily corrected, leads in children to masturbation.

Treatment. The *ascaris lumbricoides* are readily removed by the following "worm powder":

℞. Santonini, ... gr. ¼–j–ij .016–.065–.13 Gm.
Hydrargyri chlor. mitis, ... gr. ⅓–ij .022–.13 Gm. M.
Ft. chart.

Sig.—At bedtime, followed by a dose of *oleum ricini* before breakfast.

For the *oxyuris vermicularis* the above *santoninum* powder, with the use of *enemata* of *quassia*, *alumen*, *sodii chloridum*, or

℞. Acidi carbolici, ... gr. v–x .3–.6 Gm.
Aquæ, ... Oj 480. Cc.

according to the age, the injection not to be retained; or an enema of a weak solution of corrosive sublimate (1 to 10,000). Always precede any of the medicated enemata by a large injection of water to unload and clear the rectum. Washing the anus and external genitals with a solution of *acidum carbolicum* should also be employed. For the pruritus ani apply a little *unguentum hydrargyri* or *extractum hamamelis fluidum*.

TRICHINOSIS.

Synonyms. Trichiniasis; Trichinæ; Trichina spiralis; "flesh-worm disease."

Definition. A typhoid condition, the result of the entrance of a parasite—the *Trichina spiralis*—into the intestinal canal, and their subsequent migration into the muscular structure; characterized by severe gastro-intestinal irritation, severe muscular soreness, and a low typhoid condition.

Cause. The *Trichinæ spiralis* are introduced into the human body by eating the infected hog's flesh, either raw or but partly cooked.

Description. The parasite is found in two forms, to wit: *intestinal trichina*, which is sexually mature, and *muscle trichina*, which is sexually immature.

The *intestinal trichina* is a small, hair-like worm, the male measuring $\frac{1}{18}$ of an inch, and the female $\frac{1}{8}$ of an inch in length; the head is smaller than the rest of the body; the tail of the male has a bi-lobed prominence, between the divisions of which the anal opening is placed, and from which a single spiculum can be protruded; the female has a blunt, rounded tail, the reproductive outlet being situated toward the anterior part of the body; the ova are very small, containing embryos being produced viviparously at the rate of at least one hundred each week after the entrance of the female into the intestinal canal.

The *muscle trichina* develops its sexual apparatus after it has entered the intestinal canal of the host.

The viable embryos discharged from the female are in a state of motion, and at once migrate from the intestines to the muscular structure of the individual, and here set up inflammatory action, they becoming surrounded by a capsule or shell in which they are coiled.

After a time, in the muscle, the *trichina* undergoes a further change; lime salts being deposited in and about the capsule and in the parasite itself, when minute specks of lime are seen distributed throughout the muscular structure.

The development of the parasite from the period of impregnation up to the time of sexual maturity is, under favorable conditions, less than three weeks. Within two days from the ingestion of the infected pork occurs the maturation of the muscle larvæ; in six days more the birth of embryos occur, and in about two weeks the migrating progeny have arrived at their *habitat*, the muscular structure.

Symptoms. These depend upon the number of parasites in the infected food. According to Dr. Sutton, of Indiana, a piece of pork the size of a cubic inch contained eighty thousand trichinæ. There are *three stages* described, to wit: the *intestinal*, the *migration*, and the *encapsulation*.

Intestinal stage, a gastro-intestinal inflammation, with *nausea*, *vomiting*, and *watery diarrhœa*, the severity depending upon the number of the parasites ingested.

Migration stage, a *typhoid-like fever*, *rapid*, *feeble pulse*, profuse *sweats*, intense *thirst*, dry tongue and lips, and *red*, *swollen face*, with *soreness* and *tenderness* of the *muscular structure*, increased by any muscular act. As a rule the mind is clear but decidedly *apathetic*.

Encapsulation Stage. If the number of parasites ingested has been few, recovery may occur in this stage; but if the number has been large, the gastro-enteritis, fever, and muscular phenomena are severe, the patient is in a critical condition, between twenty and fifty per cent. succumbing.

Diagnosis. Unless the physician has some intimation of the cause, cases are readily mistaken for either ordinary ileo-colitis or typhoid fever.

Prognosis. Depends upon the number of trichinæ in the pork eaten. Mortality between twenty and fifty per cent.

Treatment. The preventive treatment consists in eating no pork that has not been so prepared as to kill any trichinæ that might exist. If the parasites have been recently taken, within the first four or five days, *emetics* and *purgatives* or the stomach washed out with intestinal irrigation to remove them from the stomach and intestinal canal are indicated. After thorough action from these, attempts may be made to destroy such of the parasites as have escaped the action of the emetic or purgative. For this purpose much is said in favor of *glycerini*, one part; *aquæ*, two parts; so that one teaspoonful (4 Cc.) of glycerinum be administered every hour; or a trial can be made of *acidum carbolicum* and *tinctura iodi*, as suggested by Prof. Bartholow. *Quininæ sulphas* gave the best results in the cases seen by Dr. Sutton.

After *migration* has begun, the powers of life should be sustained by nourishing food, stimulants, and tonics, as "there are no drugs which have any influence upon the embryos in their migration through the muscles." (Osler.)

DISEASES OF THE PERITONEUM.

PERITONITIS.

Synonym. Inflammation of the peritoneum.

Definition. A fibrinous inflammation of the peritoneum, either *acute* or *chronic*, characterized by fever, intense pain, tenderness, tympanites, vomiting, and prostration. It may be limited to a

part, *local*, or it may involve the entire membrane, *general*, peritonitis.

Causes. *Acute variety:* Intense cold; protracted irritation by blisters; blows upon the abdomen; penetrating wounds of the abdomen; inflammation or perforation of the stomach, intestines, gall or urinary bladder, vermiform appendix, or the surrounding parts; inflammation of the pelvic viscera; septicæmia or pyæmia; erysipelas; hernia.

Many surgeons doubt that peritonitis is ever an idiopathic disease, but that rarely it does so occur is probable.

Chronic variety: Tuberculosis; nephritis; scrofula; cancer; sclerosis of the liver.

Pathological Anatomy. *Acute form:* hyperæmia of the serous membrane, the capillaries distended and occasional extravasations of blood from their rupture; the normal secretion is arrested, and the shiny membrane becomes dull and opaque, from an exudation of pure fibrin, which is adhesive, gluing the parts together; if the inflammatory action is now arrested, it is termed *adhesive* peritonitis; if, however, the action progress, an effusion of serous fluid is poured out into the peritoneal cavity, the amount varying from a few ounces to several gallons; this is termed *exudative* peritonitis. If recovery result, the fluid is absorbed with much of the solid exudation, the unabsorbed portions forming adhesions between the membrane and the different abdominal organs, often causing great deformity and irregularity in their relations.

Local circumscribed peritonitis is the same as general except that adhesions develop around the site of attack so rapidly that the inflammatory action is encapsulated. Why this occurs in some cases and not in others is not known. Pus develops if the absorption is not prompt or if any cachexia be present.

The chronic form follows the acute, or is associated with tuberculosis, scrofula, Bright's disease, or sclerosis of the liver.

The membrane is irregularly thickened and opaque, with strong adhesions to one or more coils of the intestine, the liver, or spleen; the quantity of fluid present is small, purulent, or sero-purulent in character, and encysted by the agglutinated membrane.

Symptoms. *Acute form:* the onset is sudden, with a *chill*, *fever*, 101–3°, *pulse* 100–140, wiry and tense, *severe pain*, cutting or boring in character, and *tenderness*, becoming so great that the slightest

touch aggravates it, the *decubitus* being on the back with flexed thighs; the *abdomen* is *distended* and *rigid*, from *constipation*, *effusion*, and *meteorism*; the diaphragm is pushed up as far as the third or fourth rib in severe cases, causing compression of the lungs and displacement of the heart, liver, and spleen. There is *impaired appetite*, intense *thirst*, and *nausea* and *vomiting* are almost constant, as is *hiccough*. The patient passes through the various steps of the disease rapidly, *collapse* soon occurring. It is a clinical fact that a subnormal temperature is of frequent occurrence in acute peritonitis.

Secondary form, from extension, begins with local and gradually increasing pain, the temperature increases, tense pulse, and vomiting. If *from perforation*, it is announced by severe pain and all the symptoms of shock.

Purulent peritonitis, usually secondary (most commonly seen in those with chronic Bright's disease), is accompanied with hectic phenomena.

These symptoms continue from six to eight days, when they begin to decline and a tedious convalescence ensues, or pain and tenderness grow more marked, strength fails, surface cold, pulse rapid, and collapse, with hippocratic face, anxious expression, pinched features, sunken eyes, and drawn upper lip.

Chronic form, usually of tubercular origin, though other causes are given, shows irregular *chills*, *fever*, and *sweats*, *distended abdomen*, *constipation* alternating with *diarrhœa*, diffused *tenderness*, with *points of intenseness* and *hardness; colicky pains* during digestion, *rapid emaciation*, and failure of strength. Usually the lower portions of the abdomen give a dull note on percussion, from the presence of fluid, or scattered points of dullness, showing the presence of encysted fluid.

Diagnosis. The question of diagnosis in peritonitis is of great importance, as it is so frequently, if not always, associated with the diseases and accidents of the abdomen.

Acute gastritis differs from peritonitis in having a history of corrosive poisoning, severe pain, limited to the stomach, with early and severe vomiting; while the latter has fever, diffused abdominal pain and tenderness, with decided distention.

Acute enteritis has localized pain and tenderness with marked diarrhœa; constipation being the rule in peritonitis.

Rheumatism of the abdominal muscles occurs with a rheumatic

history, is subacute, lacks the great abdominal distention and suffering expression of peritonitis, and, while tenderness exists, it is not aggravated by deeper pressure.

Biliary colic, or the passage of a *gall-stone*, has, as a prominent symptom, excruciating pain, localized over the common bile duct, which is of a paroxysmal character and followed by slight passing jaundice. In *renal colic* the acute pain follows the course of the ureters, with retracted testicle and altered urinary secretion.

Prognosis. Always uncertain, but if symptoms progress slowly, quite favorable, as fatal cases usually end during the first week. Cases from perforation unfavorable.

Chronic peritonitis being generally of tuberculous origin, the prognosis is unfavorable, although partial and complete recovery results in the cases following the acute form of the disease.

Treatment. The peritoneal membrane being of such vast extent, its general inflammation is one of the most formidable diseases the physician meets.

Acute form: Idiopathic and robust cases, locally, *leeches* or *wet cups*, followed by *cold* or *hot* applications, as most agreeable, or covering the abdomen with a *blister;* adynamic cases, *dry cups*, followed by warm applications medicated with *tinctura opii.*

The profession is divided between two plans of treatment for peritonitis, one side favoring *opium* and the other party as strongly urging *saline purgatives* and *laparotomy.*

Prof. Da Costa says *opium* and *quininæ sulphas* are the remedies indicated at the onset of the disease, to wit: at once hypodermic of *morphinæ sulphas*, gr. ¼–⅓ (0.016–0.022 Gm.), maintaining the effect by hourly doses of either *morphinæ sulphas* or *opium*, by the mouth. Prof. Clark ascertained the tolerance of opium in this disease by the tremendous amounts used in a case under his care; the first day he gave 200 gr., the second day 472 gr., the third day 236 gr., fourth day 120 gr., fifth day 54 gr., sixth day 22 gr., and on the seventh day 8 gr. Prof. Clark found that, as a rule, however, *morphinæ sulphas*, gr. ⅙–¼ (0.011–0.016 Gm.), every two hours, would maintain the effects of the drug. The *opium* should be guarded with sufficient doses of *atropinæ sulphas*. *Quininæ sulphas*, gr. v (0.3 Gm.), every four hours until exudation, after which gr. ij (0.13 Gm.), four times a day, is of marked benefit.

While the opium treatment places the patient as well as the bowels

"in splints" and relieves the pain, it is urged by the advocates of *saline purgatives*, however, that instead of locking up the bowels, the use of salines puts the bowels into active peristaltic action, whereby the peritoneal cavity is drained of the products of inflammation and the inflamed surfaces are relieved of all engorgement by a thorough depletion of the vessels in the intestinal walls, the pulse and temperature are improved, the pain is lessened as quickly as by opium, and the formation of adhesions and bands is prevented.

Should the active symptoms continue under either plan of treatment, *laparotomy* is indicated, and indeed there is a growing opinion that cases of peritonitis should at once be handed over to the surgeon.

The decline of the vital powers must be averted by *regulated nutrition* and *free stimulation*.

Locally, an ointment of *belladonna* and *hydrargyrum* is of value.

During *convalescence*, perfect quiet, nourishing diet, moderate stimulation, scattered flying blisters, and the following:

℞. Potassii iodidi, ...	gr. v–x	.3–.6	Gm.
Ferri pyrophos., ...	gr. ij	.13	Gm.
Elix. simpl., ...	f℥ ss	2.	Cc.
Aquæ destillatæ, ... ad	f℥ ij	ad 8.	Cc.

Every six hours.

should constitute the treatment, with tonic doses of *quininæ sulphas*.

Peritonitis from *perforation*, absolute quiet, hypodermic injections of *morphinæ sulphas*, ice locally, and stimulants per mouth, rectum, or hypodermically, and laparotomy.

For puerperal and other varieties of peritonitis following disease of ovaries, tubes, uterus, and laparotomy, the reader is referred to works on gynecology and surgery.

Chronic peritonitis; locally *tinctura iodi*, and internally *opium*, for pain; *potassii iodidum* as an absorbent, with nourishing diet, *oleum morrhuæ* and *stimulants*, and rest in bed.

ASCITES.

Synonyms. Dropsy of the abdomen; peritoneal dropsy; hydroperitoneum.

Definition. A collection of serous fluid in the abdomen, or more correctly in the peritoneal cavity; characterized by a distended abdo-

men, fluctuation, dullness on percussion, displacement of viscera, embarrassed respiration, *plus* the symptoms of its cause.

Causes. Ascites may form part of a general dropsy, to wit: cardiac or nephritic. The most common factor in its production is a *mechanical obstruction* of the portal system from cirrhosis of the liver, pressure of tumors, diseases of the heart or lungs.

Pathological Anatomy. The quantity of fluid in the peritoneal sac varies from a few ounces to many gallons. It is generally of a straw color, or at times greenish, and is transparent, having an *alkaline* reaction. When blood is present in any great quantity, it points to cancer as a cause. The peritoneum becomes cloudy, sodden, and thickened, from long contact with the fluid.

Symptoms. The onset is insidious, and considerable *swelling of the abdomen* occurs before the disease attracts attention. *Constipation*, from pressure of the fluid on the sigmoid flexure. *Scanty urine*, from pressure on the renal vessels. *Embarrassed respiration* and *cardiac action*, from displacement of the diaphragm upward. The *umbilicus* is forced *outward*.

Physical signs: on *palpation*, a peculiar wave-like impulse is imparted to the hand lying on the side of the abdomen, while gently tapping the opposite side.

Percussion: patient erect, the fluid distends the lower abdominal region, with *dullness* over the site of the fluid and a *tympanitic note* above; if the patient turns on his side, the fluid changes, and dullness over the fluid, tympanitic note over the intestines.

Diagnosis. *Ovarian tumors* differ from ascites in the history, in that the enlargement is limited to the iliac fossa, instead of a uniform abdominal enlargement, not changing its position when the patient changes posture, and by the detection of a tumor by conjoined manipulation through vagina, or by rectal exploration.

Pregnancy differs from ascites in the character of the enlargement, the history, absence of menses, increase of mammæ, change in the neck of the uterus, absence of fluctuation, and the presence of the sounds of the fœtal heart.

Distention of the bladder has been mistaken for ascites; the points of distinction are, in the former, the history, presence of tenderness over the bladder, rounded outline of the percussion dullness, and the relief afforded by the catheter.

Chronic peritonitis is differentiated by the history, pain, tenderness,

more or less vomiting, thickened abdominal walls, and its generally being associated with tubercle or cancer.

Chronic tympanites presents the enlarged abdomen, but lacks the history, the dullness, and the fluctuation, giving instead a tense abdomen and a universal tympanitic note.

Prognosis. Influenced by the causes producing it. *Idiopathic ascites*, which is most rare, terminates in health within a few weeks. If *peritoneal*, generally favorable. If from *organic disease*, most unfavorable, for while the dropsy may be removed, it as rapidly returns.

Treatment. The first indication is to treat the cause of the ascites and the second to remove the fluid.

Three modes of removing the fluid present themselves: *first*, by hydragogue cathartics; *second*, diuretics and diaphoretics, and *third*, tapping. The first and second modes may be combined, as follows:

℞. Pulv. jalapæ comp., ... ʒj–ij 4.–8. Gm.
In water, an hour before breakfast;

And—

℞. Potassii acetat., ... gr. xxx 2. Gm.
Spts. ætheris nitrosi, ... ♏ xv 1. Cc.
Infus. digitalis, . . . q. s. ad fʒij ad 8. Cc. M.
Every six hours.

Or instead use the following:

℞. Hydrargyri chlor. mitis, . . . gr. iij .2 Gm.
Ext. opii, ... gr. $\frac{1}{12}$ .005 Gm. M.
Ft. pil.
Sig.—One every three or four hours.

If these fail, as they certainly will after a time, the embarrassed respiration and cardiac action will call for *tapping*, which may be done with the *trocar* or the *aspirator*. The tapping does not remove the cause, and the fluid often rapidly accumulates again. Before tapping always examine the bladder, using the catheter if there be any doubt.

As all modes of treatment weaken the patient, the diet should be highly nutritious, and the system supported with *strychninæ sulphas*.

DISEASES OF THE BILIARY PASSAGES.

CATARRHAL JAUNDICE.

Synonyms. Catarrh of the bile ducts; icterus.

Definition. An acute catarrhal inflammation of the mucous membrane of the bile ducts and of the duodenum; characterized by gastro-intestinal derangement, yellowness of the skin and sclera, itching of the skin, feverishness, and mental depression.

Causes. Excesses in eating and drinking; a debauch; malaria; climatic, as cool nights succeeding warm days.

Pathological Anatomy. The mucous membrane of one or more of the bile ducts, or of the duodenum, becomes hyperæmic, swollen, and thickened, from an effusion of serum into the submucous tissue; the result of this condition is the closure of the biliary passages, thereby impeding the outward flow of bile. The bile in the hepatic ducts being retained by the obstruction, the result is a staining of the liver substance and an *absorption* of bile, and its appearance in the blood.

Symptoms. Begins by *epigastric distress, coated tongue, impaired appetite, nausea,* with perhaps *vomiting,* and *looseness of the bowels* and *slight feverishness,* the phenomena of a gastro-intestinal catarrh. In from three to five days the *eyes become yellow* and *jaundice* gradually appears over the whole body; the feverishness disappears, the *skin* becomes harsh, dry, and *itchy,* the *bowels constipated,* the *stools whitish* or *clay-colored,* accompanied with much *flatus,* and *colicky pains;* the *urine heavy* and *dark,* loaded with urates and containing biliary elements.

A few drops of the urine placed on a whitish surface, and a drop or two of nitric acid made to flow against it, will exhibit the following "*play of colors*": a *greenish* tint, from the conversion of bilirubin into biliverdin, quickly followed by *blue, violet, red,* and *yellow,* or *brown.*

When the *jaundice* is complete, the *surface is cold,* the *heart's action slow,* the *mind torpid* and *greatly depressed,* and pain or tenderness on pressure over the hepatic region.

Duration. In from three to five days after the jaundice appears the symptoms subside, save the torpid bowels, depression, and discolored skin, which slowly disappear, often requiring a week or two.

Diagnosis. There are two varieties of jaundice, and in arriving at a diagnosis this must be remembered. There is *hepatogenous*, obstructive or catarrhal jaundice, and *hematogenous*, non-obstructive or blood-change jaundice.

The numerous diseases of which jaundice is a symptom will be differentiated when treating of them.

Prognosis. Catarrhal jaundice always favorable; if the attacks are of frequent occurrence, however, they are apt to lead to organic hepatic changes. If jaundice shows tendency to linger, it is probably result of organic condition.

Treatment. Rest in bed, with a carefully regulated diet, avoiding all starchy, fatty, or saccharine articles, milk being the most suitable, adding lime-water if the stomach be irritable.

The jaundice being the result of an acute catarrh of the duodenum and the ductus choledochus communis, treatment is to be directed to this condition by such remedies as *sodii phosphas*, ʒj (4 Gm.), well diluted, every four hours, or calomel and soda (℞. Hydrargyri chloridi mitis, gr. ¼ (0.016 Gm.); sodii bicarbonatis, gr. iij (0.2 Gm.); sacc. lac., gr. iij (0.2 Gm.); M. Sig.—Taken dry on tongue every two or three hours until one dozen are used, followed by Hunyadi Janos water), or the following:

℞.	Sodii bicarb., ...	ʒiv	15. Gm.
	Tinct. nucis vom., ...	fʒiv	15. Cc.
	Tinct. capsici, ...	fʒj	4. Cc.
	Tinct. rhei, ...	fʒij	60. Cc.
	Inf. gent. comp., . . . q. s. ad	fʒvj	ad 180. Cc.

Sig.—Dessertspoonful every four or five hours, in water.

For the dry, itchy skin *diaphoresis* is indicated. The warm or hot bath night and morning is valuable, adding *potassii carbonas*, ʒj (30 Gm.) to each. A weak carbolic solution often relieves a troublesome itching, and *potassii bromidi*, gr. xxx (2 Gm.), overcomes the insomnia and restlessness of itching.

If the urine continues scanty, *diuretics* should be used, a simple and efficacious one being *potassii bitartras lemonade* at very frequent intervals. *Spiritus ætheris nitrosi*, ♏x–xx (0.6–1.3 Cc.), diluted, is always valuable for torpid kidneys.

If under the above plans of medication the constipation continues, a pill of aloes and podophyllum may be useful.

A special plan, which is said to be effective, is with "enemata of cold water. By means of an irrigating apparatus the large intestine is well distended with water once a day for several days. The first enema has a temperature of 60° F., and subsequent injections are a little warmer. The increased peristalsis of the bowels and the reflex contractions of the gall-bladder dislodges the mucus obstructing the gall ducts. When the bile flows into the intestine, digestion is resumed and the catarrhal inflammation subsides." Other remedies may be conjoined with the irrigation method.

For *convalescence :*

℞.	Strychninæ sulph., ...	gr. ss	.03 Gm.
	Acid. nitrohydrochloric. dil., . .	f℥iv	15. Cc.
	Tinct. gentian. comp., ...	f℥iiss	75. Cc.

Sig.—Teaspoonful after meals, well diluted.

BILIARY CALCULI.

Synonyms. Hepatic calculi ; gall-stones ; hepatic colic.

Definition. Concretions originating in the gall-bladder, or biliary ducts, derived partly or entirely from the constituents of the bile. Their presence is generally unrecognized until one or more attempt to pass along the ducts, when an attack of *hepatic colic* is produced.

Causes. Gall-stones result from the *precipitation* of the crystallizable *cholesterine*, and its combination with inspissated mucus in the gall-bladder or ducts.

A disease of middle life, and more frequent in the obese, and in women.

Gall-stones are said to be common in carcinoma of the stomach or liver.

Pathological Anatomy. Cholesterine is the chief constituent of biliary calculi. Commonly several stones exist, and rarely one ; as many as six hundred are recorded. They are generally found in the gall-bladder or cystic duct, rarely in the liver or hepatic duct.

Symptoms. The presence of gall-stones or biliary calculi is made known only by their expulsion from the gall-bladder, whence is developed hepatic colic.

Hepatic colic begins suddenly, at the moment a gall-stone passes from the gall-bladder into the cystic duct.

The patient is seized with a *piercing, agonizing pain* in the region of the gall-bladder, and spreading over the abdomen, right chest and shoulder; the *abdominal muscles* are *cramped* and *tender;* there are *nausea* and *vomiting*, a small, *feeble pulse, cool skin, pale, distorted, anxious face*, with, may be, fainting, spasmodic trembling, chills, or convulsions.

The paroxysm continues from an hour or two to several days, with remissions, but entire relief is not afforded until the stone reaches the duodenum, when the pain suddenly ceases.

Jaundice usually follows the paroxysm of pain. When the calculi reaches the intestines, the pain, nausea, and vomiting cease, the appetite returns, and the jaundice soon disappears.

Should the calculi become impacted, *ulcerative perforation* and consequent *peritonitis* follow, the calculi discharging by the intestine, stomach, or through the abdominal walls.

Diagnosis. The malady should not be mistaken if *severe pain*, diverging from the hepatic region, and nausea and vomiting are present, suddenly terminating, and followed by slight *jaundice.* The diagnosis is always made positive by diluting the stools voided for the day following an attack of suspected hepatic colic, and passing them through a sieve, when the stone will be secured if present.

Prognosis. Usual termination is in health. The prognosis becoming more unfavorable if ulcerative perforation result.

Treatment. For the *colic*, hypodermic injections of *morphinæ sulphas*, gr. ⅙–⅓–½ (0.011–0.022–0.3 Gm.), combined with *atropinæ sulphas*, gr. $\frac{1}{60}$ (0.001 Gm.), and warm fomentations over the hepatic region, are indicated. *Oleum olivæ puræ*, f℥ij–iv (60–120 Cc.), every hour or two, sometimes does good.

Prof. Bartholow strongly urges the following prophylactic treatment: Carefully regulated diet, abstinence from all fatty and saccharine substance, daily exercise, stoppage of all excesses, and the long use of *sodii phosphas*, ℥j (4 Gm.), before meals, well diluted, to which may be added, if gastro-intestinal catarrh be present, *sodii arsenias*, gr. $\frac{1}{20}$ (0.003 Gm.), or *aurii et sodii chloridum*, gr. $\frac{1}{20}$ (0.003 Gm.), together with either Vichy or Saratoga Vichy water.

DISEASES OF THE LIVER.

CONGESTION OF THE LIVER.

Synonyms. Torpid liver; biliousness.

Definition. An abnormal fullness of the vessels of the liver, with consequent enlargement of that organ; it is termed *active* when arterial; *passive* when venous. The condition is characterized by torpidity of the digestive and mental functions, and slight jaundice.

Causes. *Active congestion;* heat, atmospherical or artificial; habitual constipation; malaria; excesses in eating and drinking; alcoholic or malt liquors. In females, an arrested menstrual epoch may give rise to an attack.

Passive congestion; cardiac and pulmonary diseases.

Pathological Anatomy. The liver is enlarged in all directions, and is abnormally full of blood. Cases due to obstructive diseases of the heart or lungs present the so-called "nutmeg liver," to wit: "At the centre of each lobule the dilated radicle of the hepatic vein, enlarged and congested, may be discerned, while the neighboring parts of the lobule are pale," the radicles of the portal vein containing less blood.

Long-continued congestion establishes atrophic degeneration of the organ; the decrease in size is confounded with the condition of cirrhosis, but the "atrophic liver" is smooth, while the "cirrhotic liver" is nodulated.

Symptoms. *Active congestion;* following cause, rapidly produced *malaise*, *aching of limbs*, evening *feverishness*, *headache*, depression of spirits, *yellowish tongue*, disgust for food, *nausea*, and, may be *vomiting*, *constipation*, *scanty*, high-colored *urine*, with a feeling of *fullness*, *weight*, and *soreness* in the hepatic region, with dull pain extending to the right shoulder, and slight *jaundice*, the *eye yellow*, and the *complexion muddy*. Duration about a week.

Passive congestion; onset gradual, with a feeling of weight and fullness in the hepatic region, slight jaundice, and symptoms of gastro-intestinal catarrh.

On percussion the hepatic dullness is increased in all directions.

Diagnosis. Acute congestion is continually confounded with *catarrhal jaundice;* the latter begins with marked gastro-intestinal symptoms and distinct jaundice; in the former these are less marked.

Obstructive congestion is diagnosticated by the clinical history.

Atrophic or *nutmeg liver* will be differentiated from cirrhotic liver when speaking of the latter.

Prognosis. *Active congestion* favorable, unless repeated attacks occur, rapidly succeeding each other, when "atrophic degeneration" results.

Passive congestion controlled entirely by the cause.

Treatment. Attacks due to *excess in eating and drinking*—

℞. Sodii bicarb., ...	gr. v	.3	Gm.
Pulv. ipecac., ...	gr. ss	.03	Gm.
Hydrargyri chloridi mit., . . .	gr. iij–v	.2–.3	Gm.

repeated, followed by *saline*, or *sodii phosphas*, ʒj (4 Gm.), every four hours until free catharsis, or followed by

℞. Acid. nitro-hydrochloric. dil., . .	♏x	.6 Cc.
Elix. taraxaci comp., ...	fʒij	8. Cc.

Before meals.

Attacks due to *malaria;* the above purgatives, followed by *quininæ sulph.*, gr. iv (0.26 Gm.), every four hours.

Attacks occurring with cardiac or pulmonary diseases must be managed by treating the cause.

The tendency to constipation must be overcome by the *saline laxative waters*, to wit: Congress or Hathorn, Hunyadi Janos, or *sodii phosphas*, ʒj–ij (4–8 Gm.) three or four times daily, well diluted.

Locally, in acute attacks, hot cloths or sinapisms are of benefit.

In *chronic cases* benefit follows the long use of *strychninæ arseniat.* or *sodii arseniat.*, and great comfort and support is given by the use of the "*hydropathic belt*," which is made of stout muslin, shaped to the abdomen, with cross-pieces of tape on the inner side, which keeps next to the skin a fold of cloth wrung out of cold water, and a piece of waterproof cloth or oiled silk, to prevent evaporation.

In persons who seem to have a predisposition to attacks of congestion of the liver upon the slightest exposure to any of the various

exciting causes, the habits and diet must be regulated, adding a course of alkaline waters and regulated exercise.

ABSCESS OF THE LIVER.

Synonyms. Parenchymatous hepatitis; acute hepatitis; suppurative hepatitis.

Definition. A diffused or circumscribed inflammation of the hepatic cells, resulting in suppuration, the abscesses being sometimes single, at times double; characterized by irregular febrile attacks, hepatic tenderness, and symptoms of deranged gastro-intestinal and hepatic functions.

Causes. The result of the absorption of putrid material by the portal radicles in dysentery; ulcers of the stomach; malaria; blows and injuries; heat; associated with or following pyæmic abscess.

Pathological Anatomy. If the result of inflammation, usually have one large abscess; if secondary to pyæmic conditions, have a number of small abscesses (multiple abscess). Usually found on right lobe. Hyperæmia, swelling, effusion of lymph, degeneration and softening of the hepatic cells; suppuration, beginning in points in the lobules and coalescing. The abscess walls consist of the liver structure, more or less changed.

The abscess may advance toward the surface of the liver, bursting into the peritoneum, intestines, stomach, gall-bladder, hepatic duct or vein, or into the pleura or lungs, or externally through the abdominal walls; after the discharge of pus, cicatrization occurs, or the pus may be absorbed, the tissues around forming a dense cicatrix.

Symptoms. Very obscure. *Fever* simulating markedly intermittent or remittent fevers; disorders of the gastro-intestinal canal with *obstinate vomiting*, *debility*, and great *irritability* of the *nervous system*, *melancholia*, slight *jaundice*, *constipation*, the *stools light* colored, and if of long duration, *typhoid symptoms*.

Locally, if the abscess is near the surface, *prominence of the hepatic region*, *throbbing*, limited *tenderness*, and if the abscess tends to the surface, redness, œdema, and fluctuation. The abscess may burst into the intestines, stomach, lungs, or pleura, the symptoms of which conditions will be pronounced.

Diagnosis. Hepatic abscess may be confounded with hydatids of the liver, hepatic or gastric cancer, abscess of the abdominal walls, and purulent effusion in the right pleural cavity.

The differentiation is most difficult, but *great aid* is obtained from the use of the *aspirator*.

Prognosis. Unfavorable. Recoveries, however, do occur. If the abscess bursts into the lungs, bowels, or externally through the abdominal wall, the case is more favorable.

Treatment. *Symptomatic*, and when *pus* is present, the use of the *aspirator* to remove it, and sustaining treatment, *quininæ sulphas*, *ferrum*, *alcohol*, and *oleum morrhuæ*.

ACUTE YELLOW ATROPHY.

Synonyms. General parenchymatous hepatitis; malignant jaundice; hemorrhagic icterus.

Definition. An acute, diffused, or general inflammation of the hepatic cells, resulting in their complete disintegration; characterized by diminution in the size of the liver, deep jaundice, and profound disturbance of the nervous system; terminating in death, usually, within one week.

Causes. Unsettled. It occurs frequently (?) in young pregnant women, from the third to the sixth month of pregnancy. Other causes are venereal excesses, syphilis, action of phosphorus, arsenic, or antimony.

Pathological Anatomy. Begins with hyperæmia of the hepatic cells, with a grayish exudation between the lobules, followed by softening, dull yellow color, and disappearance of the cells, fat globules taking their place; the liver is reduced in size and weight; the peritoneum covering the liver is thrown into folds; the spleen is enlarged; the kidneys undergo degeneration; the blood contains a large amount of urea and considerable leucin; the urine is loaded with bile pigment, and contains albumin.

Symptoms. *Prodromic period:* begins as a *gastro-intestinal catarrh*, coated tongue, nausea, vomiting, tenderness over the epigastrium, headache, quickened pulse, slight fever and slight *jaundice*.

Icteric period: jaundice deepens, pulse slow, headache increases, and persistent *insomnia*.

Toxæmic period : fever, rapid *pulse*, more complete *jaundice*, *pain*, nausea, *vomiting of blackish grumous blood*, or "coffee grounds," *tarry stools*, ecchymotic patches, *convulsions* or epileptiform attacks, *coma*, insensibility, death.

Percussion shows markedly *decreased* hepatic dullness.

Duration. Short. After appearance of jaundice, about six days.

Prognosis. Unfavorable.

Treatment. Entirely symptomatic. Prof. Bartholow "advises the trial of very small doses of phosphorus, as early as possible, as this remedy affects the organ specifically, and an action of antagonism may be discovered between them."

SCLEROSIS OF THE LIVER.

Synonyms. Interstitial hepatitis; cirrhosis of the liver; hob-nailed liver; gin-drinkers' liver.

Definition. An inflammation of the intervening connective tissue of the liver, chronic in its progress, resulting in an induration or hardening of the organ, and an atrophy of the secreting cells; characterized by gastro-intestinal catarrh, emaciation, slight jaundice, and ascites.

Causes. The prolonged use of alcoholic stimulants, gin, whisky, beer, or porter; syphilis. I have seen two cases in persons suffering with uric acid diathesis who were not alcoholics.

Pathological Anatomy. *First stage :* hyperæmia of the connective tissue (Glisson's capsule) of the liver, and the development of brownish-red connective-tissue elements, whereby the organ is increased in size and density; this increase of the connective tissue presses upon the hepatic cells, causing them to undergo fatty degeneration.

Second stage : the newly formed, imperfectly developed connective tissue contracts, causing decrease in the size and induration of the organ, its surface being nodulated. The hepatic and portal circulation is obstructed, from obliteration of their radicles.

The hepatic peritoneum is thickened and opaque, and adhesions are formed to the diaphragm, gall-bladder, and stomach.

The changes in the hepatic structure interfere with the venous circulation of all the abdominal organs, with the consequent venous con-

gestion of the stomach, spleen, pancreas, intestines, and peritoneum, and enlargement of the abdominal veins.

Cases occur in which the sclerosis takes place while the organ continues enlarged; these cases are known as *hypertrophic sclerosis*. But whether the liver be diminished or increased in size, both are the result of an abnormal development of connective tissue, in one case contraction being a prominent feature, and in the other not so.

Symptoms. No characteristic symptoms of the early stage of the affection. Persistent *gastro-intestinal catarrh*, with attacks of *jaundice*, in a drinking man, are suspicious. Symptoms of the second stages are *abdominal dropsy*, *enlargement* of the superficial *abdominal veins*, *dyspepsia*, localized peritoneal *pain*, *hemorrhages* from the *stomach* or *intestines*, muddy or slightly *jaundiced* skin and *decided emaciation;* the enormously distended abdomen with thin legs are characteristic of sclerosis of the liver.

I have seen two cases in which the condition was unsuspected until the development of a gradually increasing and persistent epistaxis, which continued until death, within a month of the onset, the liver being far advanced in sclerosis without any rational symptoms.

Diagnosis. *Atrophy of the liver*, or the nutmeg liver, is almost always confounded with sclerosis; the former occurs most commonly with obstructive diseases of the heart and lungs, and the surface of the organ is not nodulated, nor is there a history of alcoholism.

Cancer and tubercle of the peritoneum have many symptoms akin to sclerosis. The points of differentiation are, great tenderness over abdomen, rapidly developed ascites, rapid decline in strength and flesh, absence of jaundice, absence of long-continued dyspepsia, absence of hepatic changes on percussion, and the presence of tubercle or cancer deposits in other organs.

Prognosis. Terminates in death. Average duration after appearance of the dropsy, one year.

Treatment. For the changes in the hepatic structures, little, if anything, can be done; the following are some of the remedies recommended, to wit: *hydrargyri chloridum corrosivum*, gr. $\frac{1}{60}$–$\frac{1}{32}$ (0.001–0.002 Gm.), three times a day; *hydrargyri chloridum mite*, gr. $\frac{1}{100}$ (0.00065 Gm.), three times a day; *aurii et sodii chloridum*, gr. $\frac{1}{20}$ (0.003 Gm.), after meals; *sodii phosphas*, ℥ss–j (2–4 Gm.), after meals; *potassii iodidum*, after meals.

The diet must be regulated, *milk* being the most suitable, and particularly avoiding fatty and saccharine foods.

The abdominal dropsy may be temporarily benefited by *purgatives* and *diuretics*, but sooner or later *tapping* becomes necessary.

AMYLOID LIVER.

Synonyms. Waxy liver; lardaceous liver; scrofulous liver; albuminous liver.

Definition. A peculiar infiltration into, or a degeneration of, the structure of the liver, from the deposit of an albuminoid material which has been termed *amyloid*, from a superficial resemblance to starch granules.

Causes. The chief cause is prolonged suppuration, especially of the bones; coxalgia; syphilis; cancer.

Pathological Anatomy. The liver is uniformly enlarged. It presents a pale, glistening, translucent appearance, and has a doughy consistency. On section, the surface is homogeneous, is anæmic and whitish. The deposit begins in the arterioles and capillaries, finally closing them.

The reaction with iodine and sulphuric acid affords a certain test of the amyloid or albuminoid deposits. After further cleansing, brush over the parts a solution of iodine with iodide of potassium in water, when they will assume a mahogany color, and if diluted sulphuric acid be added, a violet or bluish tint is produced.

A pretty reaction is to take a one per cent. solution of aniline violet, which strikes a red or pink color with the amyloid or albuminoid material, while the unaltered tissues are stained blue, thus showing a beautiful contrast.

The amyloid change involves the spleen, kidney, intestines, and other organs.

Symptoms. Nothing characteristic. Hepatic dullness increased, with prominence over the liver; absence of pain; splenic dullness increased; emaciation and anæmia; urine increased in amount, pale and containing some albumin, due to amyloid changes in the kidneys. Disorders of digestion, with diarrhœa, due to amyloid changes in the intestines. Jaundice is rare. Ascites seldom occurs.

Prognosis. Unfavorable. The progress is rapid or slow, depending upon the cause.

Treatment. No specific. Prof. Da Costa recommends *ammonii chloridum*, gr. x–xx (0.6–1.3 Gm.), three times daily, for several weeks, then change for the same length of time to *syrupus ferri iodidum*, beginning with ♏x (0.6 Cc.), gradually increased to f℥j (4 Cc.) after meals, then to the former again, and so on, for months. Life may be prolonged by the use of *ferrum*, *syrupus calcii lactophosphas*, and *oleum morrhuæ*.

HEPATIC CANCER.

Synonym. Carcinoma of the liver.

Definition. A peculiar morbid growth, progressively destroying the hepatic tissue; characterized by disorders of digestion, anæmia, emaciation, jaundice, and ascites, and terminating in the death of the patient.

Causes. Hereditary, when it is termed *primary* cancer; extension from other organs, termed *secondary* cancer. It is a disease of advanced life, from forty to sixty years of age.

Pathological Anatomy. The most common variety of cancer of the liver is a compound of the medullary and scirrhus.

The cancer cells develop from the interlobular connective tissue, and as they grow the hepatic cells atrophy, the result of the pressure of the new growth. The branches of the hepatic artery enlarge and permeate the growth, while the branches of the portal vein are compressed and atrophied, thereby blocking up the portal circulation.

The cancer may develop in nodules or masses, or may be diffused; the nodules vary in size, and those on the surface are rounded, with a central umbilication. The peritoneum is adherent, cloudy, and thickened.

Symptoms. The development of hepatic cancer is preceded by a history of dyspepsia, flatulency, and constipation. *Uneasiness*, *weight*, and *pain*, increased by pressure, are noticed; *jaundice*, *ascites*, occasionally intestinal *hemorrhages*, *emaciation*, *feebleness*, *anæmia*, *cold*, *dry*, *harsh skin*, *pinched features*, with *dejected*, worn *expression*. *Fever never occurs unless there is some complicating*

condition. The hepatic dullness is increased, with pains on palpation, and the liver is indurated, irregular, and nodulated.

The duration is less than a year from the time the disease is recognized.

Diagnosis. The points of differentiation are the *age*, *cachexia*, *pain*, and *tenderness*, *enlarged liver* with *hard nodules*, and *rapid* emaciation and progress of the disease.

Prognosis. Always terminates in death.

Treatment. Early symptomatic. Sooner or later *opium* must be used to relieve the terrible and persistent pain.

DISEASES OF THE KIDNEYS.

THE URINE.

The *normal quantity* of urine voided varies from forty to fifty ounces (1200–1500 Cc.) in the twenty-four hours; it is *decreased* by free perspiration and *increased* by chilling of the skin.

Within the twenty-four hours, the least urine is passed during the night or in the early morning, very much the greater portion being passed during the course of the day.

The *normal color* is light amber, due to *urobilin;* the color deepens if the quantity voided be decreased, and *vice versâ*. In nearly all normal urine a cloud of mucus forms after standing a short time.

The *normal reaction* is slightly *acid*, due to the *acid sodic phosphate*, *uric* and *hippuric acids*. After meals it may be *neutral* or even *alkaline*.

The *normal specific gravity* varies from 1.015 to 1.02; it is *low* when an increased quantity is passed, and *high* when the quantity is diminished.

The *normal odor* of urine is a peculiar, well-known, aromatic one; it is altered by certain foods, such as the violet stench after eating asparagus, and the garlicky odor after using garlic.

The most important organic and inorganic solid constituents held in solution, are *urea* (the index of nitrogenous excretion), from 308 to 617 gr. daily; *uric acid*, from 6 to 12 gr.; *urates of sodium, ammonium, potassium, calcium,* and *magnesium*, from 9 to 14 gr.; *phosphates of sodium*, etc., from 12 to 45 gr., and *chlorides of sodium*, etc., from 154 to 237 gr. daily.

I. Quantitative test for *urea* by hypobromite of sodium (Davy's method).

Fill a graduated glass tube one-third full of *mercury*, and add one-half drachm of the 24 hours' urine; then fill the tube evenly full with a saturated solution of *hypobromite of sodium*, and close it *immediately* with the thumb; invert the tube and place its open end beneath a sat. sol. of *chloride of sodium;* the mercury flows out and is replaced by the solution of salt; *nitrogen gas* is disengaged from the urea in the upper part of the tube.

Each *cubic inch of gas* represents 0.645 gr. of urea in the half-drachm, from which the amount passed in 24 hours may be calculated.

II. Tests for *urates* and *uric acid* by nitric acid.

Urine containing an excess of urates and uric acid, on *cooling* precipitates them (viz.: "brickdust deposits" in "pot de chambre"). *Heat* dissolves them to a certain extent.

Nitric acid deprives the soluble *neutral* urates of their bases, and produces, at first, a faint, milky precipitate of amorphous *acid urates;* adding more acid, the still less soluble *red crystals of uric acid*, resembling cayenne pepper, are deposited.

Put a small quantity of *nitric acid* in a test-tube, and pour the urine carefully down the sides of the tube upon it, and a *zone* of *yellowish-red uric acid* and altered coloring matter will form at their union; and a dense, milky *zone* of *acid* urates above this, which, however, dissolve upon agitation. (See albumin test.)

III. Quantitative test for *uric acid* by nitric acid.

To *three ounces* of the 24 hours' urine (after being slightly acidulated, boiled, and filtered while hot) add *one-tenth* as much *nitric acid;* place in a cool place for 24 hours, then collect the deposit of *uric acid* on a weighed filter, wash it thoroughly, and dry at 212° F. The increased weight represents the uric acid in part excreted, approximately.

IV. Test for the earthy and alkaline *phosphates* by the magnesium fluid.

Heat or *liquor potassæ* increases the cloudiness caused by earthy calcium and magnesium phosphates. *Acetic* or *nitric acid* clears it by dissolving them.

To two ounces of urine add one-third as much of the following solution: ℞. Magnesii sulph., ammonii chloridi puri, liquor ammoniæ, each one part; aquæ destil., eight parts; if the precipitate has a *milky*, cloudy appearance, the quantity of phosphates is normal; if *creamy*, the *phosphates* are in excess.

V. Test for the *chlorides* by nitrate of silver.

To a convenient quantity of urine add a small quantity of nitric acid, to prevent the formation of the phosphates and other salts of silver; filter this, if cloudy; add to this *one drop* of a solution of nitrate of silver (1 part to 8) and the precipitate of white cheesy lumps of *chlorides of silver* denotes that the amount of *chlorides* is normal; if, however, only a *faint milkiness* occurs, the *chlorides* are diminished.

VI. Test for *mucus* by acetic acid and liquor iodi comp.

Mucus alone is not visible, but causes *cloudiness*, from having entangled mucous or pus corpuscles, epithelium, granules of sodium urate, crystals of oxalate of lime, and uric acid in various amounts.

Add to the urine a little *acetic acid*, or, in addition, a few drops of *liquor iodi comp.*, when threads and bands of *mucin* are made visible. The addition of *nitric acid* dissolves them.

VII. Test for *albumin* by heat and nitric acid.

Slightly acidulate the urine, if necessary, by addition of nitric or acetic acid, and *boil;* this causes a *white* deposit of *coagulated albumin*, which is not dissolved by nitric acid, unless the acid is in excess.

Nitric acid causes a *white* deposit of *coagulated albumin*, which is dissolved if a large excess of acid be added. A delicate test is to put the *nitric acid* in the tube first, and then gradually pour the urine down the side of the tube upon it, when a *white zone* or *ring* of *coagulated albumin* appears. *Precaution*, see tests Nos. 3, 4, 11, and 13.

VIII. Test for *albumin* by picric acid (saturated, watery solution).

Pour a quantity of urine into a test-tube, and add the *picric acid solution* drop by drop and, as it passes through the urine, it is followed by an opaque white cloud if albumin be present. The test is very striking and beautiful. If cloudiness appears some time after, instead of at the time, it shows nothing. The test will not detect as small an amount of albumin as heat or nitric acid.

IX. Nitric-magnesian test for *albumin*. The fluid is prepared by mixing 1 part of pure nitric acid with 5 parts of a saturated solution of the sulphate of magnesium, and filtering.

One drachm of the reagent is poured into a perfectly clean test-tube; the urine should be allowed to trickle slowly down upon the fluid; if albumin be present in an amount as small as one one-hundredth of one per cent., this test will show a compact, dense, white layer. This is one of the best and most reliable tests for albumin.

X. Quantitative test for *albumin*. Approximately.

Add a few drops of *nitric acid* to a proportion of the urine, and *boil;* set this away for 24 hours, and the proportionate depth of the resulting deposit is the comparative indication—viz.: ¼–½, etc.

For minute traces of albumin Millard's fluid may be used; it is a delicate test and requires care. The fluid consists of glacial carbolic acid (ninety-five per cent.), ʒij (8 Cc.); pure acetic acid, ʒvij (28 Cc.); liquor potassæ, ʒij, ʒvj (84 Cc.).

XI. Test for *blood* by heat and nitric acid.

Heat or *nitric acid* causes deposit of albumin, with the coloring matter changed to a *dirty brown*.

XII. Test for *blood* by heat and caustic potash (Heller's).

Heat the urine, then add *caustic potash* and *heat* anew. The phosphates are thus precipitated, taking with them the coloring matter of the blood, which imparts a *dirty, yellowish-red* color to the sediment, viewed by reflected light, and when seen by transmitted light, gives a splendid *blood-red color*.

Neither the coloring matter of the blood, nor that of the bile, is precipitated with the phosphates, so that coloration of urine which shows this reaction cannot be ascribed to the presence of the latter pigments.

When the quantity of blood in the urine is very large, it is of a *dark* or *brownish-red*, and, after standing, forms a coagulum of blood at the bottom of the vessel.

Caution. Heat or nitric acid causes coagulation of the albumin.

XIII. Test for *pus* by liquor potassæ.

Add to the urine, or preferably to its deposit from standing, an equal volume of *liquor potassæ;* when well mixed, a *viscid gelatinous fluid* or mass is formed, which pours like the white of an egg, or jelly.

XIV. Test for *bile* by "fuming" or red nitric acid.

Allow a specimen of urine and a few drops of red "fuming" *nitric acid* to gradually intermingle on a porcelain dish, and a "play of colors," *green, blue, violet, red,* and *yellow* or *brown* occurs, if biliary coloring matter be present.

XV. Test for *bile pigment* by pure hydrochloric and pure nitric acids (Heller's).

Pour into a test-tube about 1.6–fʒ of pure *hydrochloric acid*, and add to it, drop by drop, just sufficient *urine* to distinctly color it. The two are mixed. Then drop down the side of the test-tube pure *nitric acid*, which will "underlay" the mixture of hydrochloric acid and urine. At the point of contact between the mixture and the colorless nitric acid a handsome "play of colors" appears. If the "underlying" nitric acid is now stirred with a glass rod, the set of colors which were superimposed upon one another will appear alongside of each other in the entire mixture, and should be studied by transmitted light.

If the hydrochloric acid, on addition of the biliary urine, is colored *reddish-yellow*, the coloring matter is *bilirubin;* if it is colored *green*, it is *biliverdin*.

XVI. Test for *sugar* by liquor potassæ and heat (Moore's).

Add to the urine half its volume of *liquor potassæ*. (*Caution*. This *may* give a white, flaky precipitate of the earthy phosphates, which should be removed by filtering.) Now *boil;* this causes, at first, a *yellow-brownish* color, becoming *darker* if much sugar is present, due to glucic and finally to melassic acid.

XVII. Test for *sugar* by subnitrate of bismuth, liquor potassæ and heat.

Add to the urine half its volume of *liquor potassæ*, and then a little *bismuth subnitrate*, shake, and thoroughly *boil;* the presence of sugar reduces the salt and *black metallic bismuth* is deposited, or, if but little sugar, a *gray deposit* occurs.

Caution. Albumin must be absent.

XVIII. Test for *sugar* by a solution of cupric sulphate, liquor potassæ, and heat (Trommer's).

Add to the urine a few drops of a solution of *cupric sulphate*, and then its own volume of *liquor potassæ*. (*Caution.* On first addition a light greenish precipitate occurs, which, on further addition of the reagent, if sugar or certain other organic matters are dissolved, giving a transparent blue liquid.) Now *boil*, and a *yellowish* precipitate of *hydrated cupric suboxide*, occurring at once, denotes the *presence of sugar*.

Caution. Albumin must be absent.

XIX. Quantitative test for *sugar* by *Pavy's* solution, to wit:

℞

Cupric sulphate, 320 gr.
Neutral potassic tartrate, . . 640 gr.
Caustic potash, 1280 gr.
Distilled water, 20 f℥.
Keep corked.

Take of *Pavy's* solution of *cupric protoxide*, recently prepared (see margin), 200 minims or a multiple of this quantity, and *boil* in a porcelain dish; while boiling, add minim by minim, from a measured portion of the 24 hours' urine, and it gives a *yellowish* precipitate of *hydrated cupric suboxide*, if sugar be present.

Note *carefully* the gradual disappearance of the *blue color*, and when *completed* (best determined by looking through the margin of the fluid against the white porcelain dish), from the amount of urine used determine the amount of sugar passed daily. *The quantity of urine containing one grain of sugar being just sufficient to reduce the 200 minims of the copper solution.*

XX. Quantitative test for *sugar* by fermentation and the specific gravity.

Take *two* measured specimens from the 24 hours' urine, and to *one* add a little *yeast*. Place each specimen in a temperature of 75° to 80° F.; in 24 hours *fermentation* having destroyed the *sugar* in the *one* containing the *yeast*, the difference in the *specific gravity* of the two specimens expresses the number of grains in each ounce of the urine, approximately.

XXI. Tests for Indoxyl-potassium sulphate (INDICAN ?).

I. *McMunn's Method :* Equal parts of urine and hydrochloric acid, with a few drops of nitric acid, are boiled together, cooled, and agitated with chloroform. The fluid is colored violet, and shows an absorption band, before D, due to indigo blue, and another after D, due to indigo red.

II. *Taffe's Method :* Mix 10 Cc. of strong hydrochloric acid with an equal volume of urine in test-tube, and while shaking add, drop by drop, a perfectly fresh saturated solution of chloride of lime, or chlorine-water, until the deepest attainable blue color is reached. The mixture should next be agitated with chloroform, which readily takes up the indigo and holds it in solution. The quantity is estimated by depth of blue color.

III. Pour 4 Cc. of hydrochloric acid into a small flask, and while stirring add from 10 to 20 drops of urine. If the proportion of indigo be above normal, the resulting color will be rather light yellow ; if in excess, the acid will turn violet or blue,—the more intense will be the color in proportion to the quantity present. If no coloration appears after waiting a minute or two, there is no excess, no difference how deep a color may subsequently appear.

NOTE.—If the urine contain albumin, it must be removed before applying these tests, otherwise the blue color often arising from the mixture of hydrochloric acid and albumin after standing may prove misleading.—*Purdy.*

XXII. Ehrlich's diazo-reaction test.

I. Take 2 Gm. (30 gr.) of sulphanilic acid, 50 Cc. of hydrochloric acid, and 1000 Cc. of distilled water.

II. Take solution sodium nitrite in water of the strength of 0.5 per cent. Place fifty parts of No. I and one part No. II in a test-tube and add equal amount of urine. The entire contents is rendered strongly alkaline by strong ammonia water.

If the diazo-reaction occur, the mixture becomes *carmine* red ; now shake the tube, and if the red color is seen in the *foam*, the test is complete. Allow the tube to stand a day and a green precipitate forms.

CONGESTION OF THE KIDNEYS.

Synonyms. Renal hyperæmia; catarrhal nephritis.

Definition. An increase in the amount of blood in the vessels of the kidneys; when arterial, it is termed *active congestion;* when venous, *passive congestion;* characterized by pain, frequent desire for urination, the amount of urine scanty, high-colored, occasionally containing albumin or blood.

Causes. *Active:* from cold; irritating substances eliminated by the kidneys, as turpentine, copaiba, cantharides, carbolic acid, nitrate or chlorate of potash; during the eruptive or continued fevers; injuries over the kidneys.

Passive: obstructive diseases of the heart or lungs, pressure of the pregnant uterus.

Pathological Anatomy. The kidneys enlarge and increase in weight; increased redness (the color being bluish if *passive*), with points of vascularity, corresponding to the Malpighian bodies, and occasionally minute ecchymoses. The abnormal hyperæmia causes a catarrhal state of the ducts of the pyramids, with shedding of their epithelium.

If mechanical (*passive*) obstruction continues for some time, increase of the connective tissue with consequent induration and contraction results, or a form of chronic Bright's disease.

Symptoms. *Active variety: pain* over kidneys and following the course of the ureters into the testicles and penis, *irritable bladder*, almost constant and pressing desire for urination, the *urine scanty, high-colored*, and *occasionally* bloody, with fibrin, casts, and albumin; there is, as a rule, no pain during the act of urination. The constitutional symptoms are headache, slight nausea, vomiting, and a general feeling of discomfort.

If the condition persist, *inflammation* of the kidney results.

Passive: the kidney changes are masked by the *lung* or *heart* trouble, until *dropsy, scanty high-colored albuminous* urine is observed.

Prognosis. *Active:* if recognized and properly treated, favorable.

Passive: controlled by the cause, and if prolonged, terminating in *interstitial nephritis.*

Treatment. The most important indication is to ascertain and

remove the cause. Rest of the body; dry or wet cups over the loins; dilute the urine by increasing the quantity of bland fluids consumed; *saline purgatives;* warm bath or other mild diaphoretics. *Infusum digitalis* is pre-eminently the remedy for congestion of the kidneys; if great *irritability of the bladder*, *camphora*, gr. ij–iv (0.13–0.26 Gm.) every four hours, combined with *morphinæ sulphas*, gr. $\frac{1}{12}$–$\frac{1}{6}$ (0.005–0.011 Gm.), or the hypodermic injection of *morphinæ sulphas*, gr. $\frac{1}{12}$ (0.005 Gm.).

The treatment of the passive form resolves itself into the treatment of the cause, remembering that there is too much blood in the veins and too little in the arteries. There are three ways of restoring the circulation. By *venesection*, opening a large vein; by increasing the power of the heart by the use of *digitalis* or *strophanthus*, preferably the first named; and by dilatation of the capillaries with inhalations of *amyl nitrite* or the internal use of *spiritus glonoini* (nitro-glycerin 1 per cent. solution), ♏j–iij (0.06–0.18 Cc.) every four hours. The bowels should be kept soluble by *salines*.

ACUTE PARENCHYMATOUS NEPHRITIS.

Synonyms. Acute Bright's disease; acute desquamative nephritis; acute tubal nephritis; acute croupous nephritis.

Definition. An acute inflammation of the epithelium of the uriniferous tubules; characterized by fever, scanty, high-colored, or smoky urine, dropsy, with more or less constant nervous phenomena, the result of acute uræmia.

Causes. The young more liable than the aged; cold and exposure; scarlatina, diphtheria, and other infectious diseases; persistent use of irritants, as turpentine, cantharides, phosphorus, ginger, and others. Blows and injuries of the back have caused acute nephritis. Pregnancy is not an uncommon cause, resulting frequently in puerperal convulsions. Malarial poisoning.

Pathological Anatomy. The kidneys are generally swollen, engorged, more vascular, and of red color; in the second stage the organ remains large, irregularly red, especially the cortex; the tubules are engorged and filled with epithelium, blood corpuscles, and fibrin. The capsule is easily detached, and is more opaque than normal.

If a favorable termination, the swelling lessens, the vascularity diminishes, the tubules returning to their normal condition.

Symptoms. In mild cases the slowly developing *dropsy*, with *anæmia*, and *dyspnœa*, or simply shortness of breath, with weakness, are the only clinical phenomena present, the diagnosis being confirmed by an examination of the urine. Usually, however, begins suddenly. *Fever*, with *nausea* and *violent* and *persistent vomiting*, dull *pain* over the kidneys, following the ureters; frequent desire to urinate; diarrhœa; *skin* harsh and dry; *pulse* quick, tense, and full. Soon *dropsy* appears, the eyelids and face become puffy and swollen, followed by general œdema of the extremities, scrotum, and abdominal walls. If the attack follow scarlatina, there are from the onset much greater pallor and general debility.

Uræmic symptoms may develop any time during the attack.

The *urine* is of high specific gravity, 1025 to 1030, scanty, smoky (like beef washings) in color, due to the presence of *blood*. *Albumin* is present in large quantities, and the microscope reveals *casts* of the uriniferous tubules, blood corpuscles, uric acid, urates, oxalate crystals, and epithelium. The total amount of urea eliminated during the twenty-four hours is lessened from one-fourth to one-half. The amount of phosphates and chlorides is also lessened.

Duration from one to four weeks.

Complications. *Pericarditis*, *pleuritis*, *pneumonitis*, *peritonitis*, and *acute uræmia*, from retention and decomposition of urea in the blood.

Diagnosis. The history, fever, scanty, smoky, albuminous urine, with dropsy beginning in the face, should prevent any error.

Albuminuria may be confounded, on account of the presence of albumin in the urine, but lacks the clinical history, usually occurring in the course of some constitutional affection, as diphtheria, cholera, yellow fever, or erysipelas.

Da Costa distinguishes between acute Bright's disease and acute nephritis by the last named "affecting only one kidney, by much greater pain and tenderness in the lumbar region, by the retraction of the testicle, and by the higher degree of febrile excitement. Then, too, the deeply colored urine which is voided contains little or no albumin."

Prognosis. Favorable. Majority of cases recover under prompt treatment. Rarely passes into chronic Bright's disease. *Uræmic* symptoms add to the gravity of the prognosis.

Treatment. *Absolute rest in bed* until all symptoms have disappeared. A strictly *milk diet* is the most suitable, but if there is much depression and weakness, may add *animal broths* and *oysters*. No tea, coffee, or stimulants. Water can be used *ad libitum*. Cream of tartar lemonade is a useful as well as pleasant drink. Locally, *dry cups* over the kidneys, followed by poultices—a *digitalis* poultice being of great value. A poultice of *jaborandi leaves* and flaxseed, half and half, will increase the action of the kidneys.

The bowels should be kept soluble with morning doses of *salines* or *pulv. jalapæ comp.*, ʒj (4 Gm.), in water before breakfast, or *elaterium*, gr. ⅙ (0.011 Gm.), repeated p. r. n. Free action of the bowels assists in relieving the overtaxed kidneys, and conjoined with free *diaphoresis* seems almost indispensable in acute nephritis. *Magnesii sulphas*, in small and repeated doses, is a valuable cathartic in nephritis, as it acts upon the kidneys as well as the bowels.

The most efficient diaphoretics are the *hot-air bath* or *pack*, or the *wet sheet and blanket bath*, stimulating the peripheral circulation, after free sweating has occurred, by rubbing with alcohol and water. For drugs, one of the very best is *spiritus ætheris nitrosi*, ♏v–xxx (0.3–2 Cc.), according to the age. *Extractum pilocarpi fluidum*, ♏v–xxx (0.3–2 Cc.), according to the age, every three or four hours, is an excellent diaphoretic; but as it is generally conceded that pilocarpus acts better when administered subcutaneously, employ *pilocarpinæ hydrochloras*, gr. ⅙ (0.011 Gm.), repeated p. r. n., by the hypodermic method. Another valuable diaphoretic is *vinum ipecacuanhæ*, ♏j–iij (0.06–0.2 Cc.), every half hour or so; combined with sweet spirits of nitre and neutral mixture it forms an excellent combination.

Diuretics are of great value, indeed, often indispensable, in acute nephritis. *Digitalis* is the most reliable diuretic in this condition, and in the form of an infusion. The following formula of Millard's is suitable in the majority of cases:

℞. Tinct. digitalis, ...	f ʒ ss	15. Cc.
Aceti scillæ, ...	f ʒ iss	45. Cc.
Spts. ætheris nitrosi, ...	f ʒ ij	60. Cc.

Sig.—Teaspoonful every two to four hours, in water.

The following combination has given excellent results:

℞. Potassii acetat., ...	ʒ iv	15. Gm.
Inf. digital., ...	f ʒ iij	90. Cc.
Liq. potassii citratis, ...	f ʒ iij	90. Cc.

Sig.—Tablespoonful every two to four hours, in water.

Other reliable diuretics are *digitalinum* (cryst.), gr. $\frac{1}{100}$ (0.00065 Gm.), *caffeinæ citrata*, gr. ij–iv (0.13–0.26 Gm.), or *sparteinæ sulphas*, gr. ⅓–½ (0.02–0.03 Gm.).

If uræmic symptoms develop, treat according to directions given in that section.

As soon as the blood disappears from the urine, a course of *ferrum*, in the shape of *Basham's mixture*, until albumin disappears and health is restored. The following is the formula of Basham's mixture:

℞. Liq. ammon. acetat.,	f℥vj	180. Cc.	
Acid. acetic.,	f℥iij	12. Cc.	
Tinct. ferri chlor.,	f℥v	20. Cc.	
Alcoholis,	f℥ij	60. Cc.	
Syrup.,	f℥iv	120. Cc.	
Aquæ,	f℥iv	120. Cc.	M.

Sig.—Dose, f℥j–f℥j, well diluted.

The addition of one minim (0.065 Cc.) *spiritus glonoini* to each dose of Basham's mixture increases its nephritic action.

Dr. James Tyson, than whom there is no greater authority in nephritic conditions, strongly urges the use of infusum digitalis instead of the tincture. He also recommends, as an admirable diuretic combination, Trousseau's diuretic wine, viz.:

℞. Junip. contus,	℥x	40. Gm.
Pulv. digitalis,	℥ij	8. Gm.
Pulv. scillæ,	℥j	4. Gm.
Vin. xerici,	Oj	473. Cc.
Macerate for four days and add		
Potassii acetatis,	℥iij	12. Gm.

Express and filter.

Sig.—Tablespoonful three times a day for an adult.

CHRONIC PARENCHYMATOUS NEPHRITIS.

Synonyms. Chronic Bright's disease; chronic croupous nephritis; chronic tubal nephritis; chronic albuminuria; large white kidney.

Definition. A chronic inflammation of the cortical and tubular structure of the kidneys; characterized by albuminous urine, dropsy, increasing anæmia, with attacks of *acute uræmia*.

Causes. Rarely follows the acute form, but in ever so many cases the etiology is unknown, and in the vast majority of cases it is primarily chronic or subacute; syphilis; chronic malaria; alcoholic excesses; chronic mercurialism; lead poisoning; opium habit; protracted suppuration; phthisis; hepatic disorders; pregnancy; some undetermined nervous condition.

It is a disease of the young, rarely occurring after forty. Principally occurring in males.

Pathological Anatomy. A large white, or yellowish white, smooth kidney, often twice the normal size. The capsule is nowhere adherent to the organ. Upon section, considerable tumefaction of the cortical substance and the rarity of vascular striæ are recognized. The medullary substance shows no appreciable alteration, its color being normal. The convoluted tubes are irregularly dilated and thickened, and filled with broken-down granulated epithelium and fibrinous casts. In pronounced cases there is fatty degeneration of the tubular epithelium.

"The intertubular matrix is greatly thickened—a change due to hyperplasia of the connective-tissue elements, to the migration of the white corpuscles and their subsequent multiplication and fatty transformation, and to a quantity of fluid exudation, the product of the increased pressure in the veins."

Symptoms. The onset is gradual and insidious, and the affection is seldom recognized until the appearance of *dropsy*, which, beginning under the eyes and in the face, extends all over the body, causing *dyspnœa* from *ascites* or *hydrothorax*, although in many cases the dropsy may be a late symptom, the patient becoming *pale*, *debilitated*, and suffering from *cardiac palpitation*, increasing *dyspnœa* on exertion, and *vomiting*, all gradually developing without apparent cause; also *headache*, *vertigo*, and *defective vision*. The *urine* is scanty, high-colored, *albuminous*, and under the microscope showing hyaline and granular *tube casts*, granular epithelium, and if fatty degeneration occur, *fatty tube* casts and oil globules. The increase above the normal amount of the urine, as the disease progresses, must not be forgotten when the specific gravity is low, 1.010–1.015, and the quantity of albumin is increased. The normal constituents of the urine, and particularly *urea*, are diminished. Irritable bladder is a very constant symptom, beginning very early in course of the disease. In the hemorrhagic form the urine almost constantly contains blood.

Anæmia is pronounced, from the large waste of albumin. *Gastro-intestinal* disorders and various *neuralgic pains* are common occurrences. *Cardiac hypertrophy* is of common occurrence. *Bronchial catarrh*, with slight *œdema of the larynx*, causing *husky voice*, are frequent complications. *Amaurosis*, the result of *neuro-retinitis*, occurs in a greater or less degree in all pronounced cases. *Uræmic* symptoms occur and especially *uræmic asthma* (renal asthma).

Da Costa calls attention to a temporary *loss of vision*, soon returning and again recurring, in a well-marked case of this disease.

Complications. Pneumonia, pleuritis, pericarditis, peritonitis, meningitis, and cardiac hypertrophy.

Prognosis. Not unfavorable, unless the urine persistently contains a large number of *fatty tube casts* and *oil globules*. Relapses are frequent, but many complete (?) recoveries are recorded. I have seen four apparent recoveries, one after twelve months' duration, another after two years' duration, and still another after five years' duration, no return showing itself after two years. The secondary contraction of the kidneys must always be kept in mind, the particular symptoms of which are increased flow of low specific gravity, urine with small amount of albumin, and hypertrophy of left ventricle, with accentuated aortic second sound.

Treatment. It is to be borne in mind that the course of a case of chronic Bright's disease is not continuously downward ; periods of remission often follow the most aggravated symptoms, the patient and his friends being buoyed with the hope of an early recovery, when, suddenly, an attack of acute uræmia terminates life.

A patient with chronic Bright's disease should, as far as possible, be relieved from all cares of business and spend a goodly portion of time in bed.

The *diet* is of prime importance. It may consist of an absolute *milk* regimen, pure, or prepared as most palatable, or an exclusive *lean meat* diet, prepared by finely chopping, removing all fibrous and fatty portions, boiled quickly, salted to taste, and served hot—the so-called "Salisbury steaks." The use of half a pint of hot water, acidulated with lemon, before each meal is valuable.

The use of *diaphoretics* and *hydragogue cathartics* are only indicated when the dropsy is marked, the skin harsh and dry, the urinary secretions scanty, and uræmic symptoms are threatening.

Diuresis should be promoted, if the secretion of urine is scant, by

digitalis, *caffeinæ citrata*, or *sparteinæ sulphas*, internally or hypodermically, or *spiritus glonoini*, and dry cups and poultices over the loins, and the use of the normal salt solution slowly injected into the bowels. The following is a good combination for scanty urine and costive bowels:

℞. Hydrargyri chlor. mitis,
Pulv. scillæ,
Pulv. digital., ... āā gr. j āā .065 Gm.
F pil.
Sig.—Three times daily for a few days.

An excellent plan to promote diuresis and diaphoresis in all forms of nephritis is by the use of *pilocarpus* locally. I have used the following ointment for several years with invariable success:

℞. Pilocarpinæ nitrat., ... gr. j–iij .065–.2 Gm.
Ung. petrolei, ... ℥j 30. Gm. M.
Sig.—Apply piece size hickory-nut over dorso-lumbar regions, night and morning, covering surface with layer of cotton or gauze.

Iron is preeminently the drug for this variety of Bright's disease, using the tinctura ferri chloridum. Large doses are not needed. Combined with spiritus ætheris nitrosi or in the form of Basham's mixture, makes an excellent combination for the ferrum; one minim (0.06 Cc.) spiritus glonoini added to each dose of the ferrum combination is useful.

The *anæmia* is to be treated by *oleum morrhuæ*, *arsenicum*, and *ferrum*, an excellent formula for the latter being—

℞. Strychninæ sulph., ... gr. ¼ .016 Gm.
Tinct. ferri chloridi, ... f℥ij 8. Cc.
Acidi acetici puræ, ... f℥j 4. Cc.
Curacoæ albæ, ... f℥j 30. Cc.
Liq. ammonii acetat., . . ad f℥vj 180. Cc. M.
Sig.—Tablespoonful every five hours, followed by a glass of cold water.

To check the waste of *albumin*, a difficult matter, the following remedies have been used with more or less success; *ergota*, *quininæ sulphas*, *acidum gallicum*, *sodii benzoas*, *tinctura cantharidis*, or *potassii iodidum*.

For *dropsy*, purgatives, such as *pulvis jalapæ compositus*, *magnesii sulphas*, and alkaline mineral waters or the *vapor baths*, or *pilocarpinæ hydrochloras*, gr. ⅛ (0.008 Gm.), repeated if not much cardiac depression, or combining *pulvis ipecacuanhæ et opii*, gr. iij (0.2 Gm.),

with *potassii nitras*, gr. iij (0.2 Gm.), every two or three hours, or *diuretin*, gr. xx (1.3 Gm.), after meals; what is most valuable is the *hot-air bath* or *pack*. If there be great distention of the serous cavities, interfering with the respiration, the *aspirator* should be used. Puncture of the skin may be necessary at times, and it is well accomplished with an ordinary cambric needle.

Cases due to *syphilis*, if the loss of renal structure is slight, are cured by a course of *hydrargyri corrosivum chloridum* and *potassii iodidum*, with *oleum morrhuæ*.

INTERSTITIAL NEPHRITIS.

Synonyms. Chronic Bright's disease; sclerosis of the kidneys; contracted kidney; small red kidney; gouty kidney.

Definition. An inflammation of the intervening connective tissue of the kidney, chronic in its progress, resulting in an induration or hardening, with contraction of the organ; characterized by the frequent voiding of large amounts of pale, albuminous urine, of low specific gravity, disorders of the gastro-intestinal canal and nervous system, and a strong tendency to cardiac hypertrophy and changes in the vessel. Cases of interstitial nephritis are not uncommon in which albumin is never detected in the urine.

Causes. A disease of middle life, from forty to sixty years. Gout a common cause; lead cachexia; syphilis; alcoholism; opium habit; following chronic cystitis and chronic gonorrhœa; long-continued worry, anxiety, or grief; alterations in the renal ganglionic centres (Da Costa and Longstreth). Hereditary influence (Tyson), secondary to chronic cardiac disease. Hepatic disorders, as the functions of the liver and kidneys are closely related. A functional disorder of the liver, if not checked, leads to organic kidney disease.

"Renal degeneration is a consequence of the long-continued elimination of products of faulty digestion through the kidneys." Uric acid is a nephritic irritant.

"There is a tendency to overgrowth in the interstitial tissue of the kidney, as of other organs, in old age. Hence the term *senile atrophy* of the kidney. It is not safe, therefore, to call every instance of atrophied kidney met in the post-mortem room a case of interstitial nephritis." (Tyson.)

Pathological Anatomy. The *kidneys* are increased in size.

The *capsule* is thickened, opaque, and adherent. The *surface* of the kidney is granular, with cysts of various sizes, of transparent color, scattered irregularly over the surface. On section the *tissue* of the kidney is tough and resistant. The *cortical* portion is thin, from atrophy, being only a line or two in thickness. The *connective tissue* is greatly thickened, compressing the tubules into mere threads, the *glomeruli* being grouped together in bunches, owing to the wasting of the intermediate tubes. The *color* varies from a darkish brown to a yellowish gray, according to the amount of blood in the organ.

The left side of the *heart* is hypertrophied, and there is also hypertrophy of the muscular fibre of the *arterioles* throughout the body; if the case is protracted, the hypertrophied tissues undergo fatty degeneration. Cardiac degeneration with arterio-capillary sclerosis or fibrosis is associated with advanced nephritis.

In many cases there occur fatty degeneration of the retinal tissues, or sclerosis of the nerve-fibre layer, changes which are termed *retinitis albuminurica*.

The "*ganglionic centres*" undergo fatty degeneration and atrophy (Da Costa and Longstreth).

Apoplexy is a frequent termination of interstitial nephritis, the rupture of a cerebral vessel suggesting it to be a disease of degeneration.

Symptoms. Onset insidious, and often marked alterations in the kidneys, heart, and vessels have occurred before the disease is recognized. There are no characteristic early symptoms in the majority of cases, the disease being apparently latent until some special outbreak causes a more thorough examination of the patient, when interstitial nephritis is detected.

Any of the following symptoms may first attract attention: *Frequent micturition; increased* amount of *urine*, fifty to ninety ounces, acid, and of a *pale color;* low specific gravity, 1005–1015; containing a small amount of *albumin*, which may be absent for days; occasional *epithelial cells* and *hyaline* and *pale granular casts*. No dropsy, but a little *puffiness* and *œdema* of the *conjunctivæ*—the Bright's eye. *Disorders of vision. Forcible cardiac action* with *high arterial tension*, due to left cardiac hypertrophy, which is an almost constant condition. Attacks of vertigo; headache; *pulsations* in the head, neck, and other parts of the body, and, as the disease progresses, cardiac distress, dyspnœa, and palpitation occur. A reduplication of the first cardiac sound is common; the second aortic sound is

accentuated and the pulse is hard and resisting, indicating high tension and thickening. "Sclerosis is distinguished from tension by obliterating the blood current by pressure and feeling the artery beyond. The sclerosed vessel continues tangible, that of high pressure disappears." (Tyson.) Disordered vision; attacks of epistaxis and disordered stomach. Progressive anæmia is a frequent symptom, with a sense of *great weakness*. Any of the following symptoms, the result of *uræmia*, may occur: Persistent *dyspepsia*, occasional *vomiting*, regardless of food; *headache*, *vertigo*, and *stupor*, or *drowsiness*; violent *itching* of the skin; *tremors*, *convulsions*, *epileptic* seizures, or *apoplectic attacks*.

The body weight declines, the skin is dry and scurfy, the strength fails, and shortness of breath on exertion is present.

Albumin may be absent from the urine throughout the entire course of interstitial nephritis, and casts be only occasionally detected after many trials, and yet the disease progresses to a fatal termination.

Towards the termination of the disease the urine diminishes in quantity, specific gravity increases, and the casts increase in number and variety, dark granular and blood casts often being observed.

The *termination* is usually by convulsions, coma, and death.

Complications. Bronchitis; pneumonitis; pleuritis; pericarditis; cardiac hypertrophy. Pericarditis is always fatal.

Diagnosis. Interstitial nephritis is most likely to be confounded with parenchymatous nephritis. The following table from Millard presents the most important point of difference between the two:

In Chronic Croupous Nephritis,	In Chronic Interstitial Nephritis,
The urine is always albuminous.	Urine not constantly albuminous.
Urine usually scanty.	Urine usually abundant.
Dropsy and œdema almost always occur.	Dropsy seldom or never present; sometimes slight œdema.
Hypertrophy of the heart seldom exists.	Some hypertrophy of heart, with increased arterial tension, almost always present.
Specific gravity of urine usually higher than the normal. Urine darker and with less of a soapy appearance than in chronic interstitial nephritis.	Urine generally of a light color and low specific gravity.

In Chronic Croupous Nephritis,	In Chronic Interstitial Nephritis,
Uræmic symptoms less frequent than in chronic interstitial nephritis.	Uræmic symptoms are met with in their most pronounced form, and in severe cases usually occur.
Epistaxis and cerebral hemorrhages rare.	Epistaxis and cerebral hemorrhages frequent.
Occurs most frequently before the age of forty.	Occurs most frequently after forty.
Blood corpuscles and connective-tissue shreds more frequently found in chronic croupous nephritis.	Absent in chronic interstitial nephritis.
	Development more gradual, the health of patient often less impaired, and duration longer than in chronic croupous nephritis.
Casts more numerous and in greater variety than in chronic interstitial nephritis; waxy, granular, fatty, and hyaline casts occurring.	Casts rare, the hyaline variety being most frequently met with.
Epithelia from the kindey and pus corpuscles more numerous than in interstitial nephritis.	Kidney epithelia and pus corpuscles scanty, and occasionally absent.
Urates and phosphates predominate; oxalates rare.	Oxalate of lime almost always occurs.
Albuminous retinitis rare.	Albuminous retinitis common.
Gangrenous erysipelas and phlegmonous swellings more common; also dyspepsia and anæmia.	
Visceral complications, as pneumonia, pleuritis, pericarditis, and bronchitis, not uncommon.	Visceral complications rare.
Diarrhœa sometimes.	
Cirrhosis of liver rare.	Cirrhosis the most frequent hepatic lesion.
Atheroma of arteries rare.	Atheroma common.

Prognosis. Pursues a very chronic course; cases recorded under observation eleven years. If the case is seen in its incipiency, a cure is possible, but as a rule we say the prognosis is unfavorable.

Treatment. To prolong life is the great indication, as the diseased kidneys cannot be restored.

Regulated diet is of first importance. The eliminating function of the kidney being lessened, the diet must be one as free from urea as possible. *Milk* should be the chief and for long periods the only nitrogenous food used; plain, skimmed, and diluted with Vichy, Apollinaris, and Seltzer waters. Eggs, soft-boiled or poached in milk. Occasionally chicken broth. The remainder of the diet should come from the vegetable list. Avoid alcoholic stimulants.

A daily warm or hot bath is valuable, but under no consideration should cold or sea bathing be allowed. Warm clothing, and protecting the body from cold and damp is most important.

Rest of mind and body as far as circumstances will permit.

The bowels should be kept regular and soluble with salines or *cascara sagrada*, which is said to be a valuable eliminator of urea; until the urine becomes scanty diuretics are not indicated. *Ferrum* should only be used for the anæmia.

For the nephritic, cardiac, and vessel changes there is no one remedy comparable with *nitro-glycerinum*, or *spiritus glonoini*, in doses of ♏j (0.06 Cc.), which equals gr. $\frac{1}{100}$ (0.00065 Gm.), repeated three to six times a day. An excellent combination in the early stages of interstitial nephritis is:

℞. Hydrargyri chloridi corrosiv., . .	gr. j	.065	Gm.
Aurii et sodii chloridi, ...	gr. j	.065	Gm.
Ferri reduct., ...	gr. xxx	2.	Gm.
Spts. glonoini, ...	♏xxx	2.	Cc.

Ft pil. no. xxx.

Sig.—One after meals.

Potassii iodidum has been recommended to prevent or hinder the connective-tissue growth. If syphilis can be traced as the causative factor, it should be given a trial.

For the *uræmic* symptoms the reader is referred to that subject.

For the gastric symptoms the following is an excellent formula:

℞. Pepsin. puræ, ...	gr. xxxij	2.	Gm.	
Acidi hydrochloric. dil., ...	f℥ss	15.	Cc.	
Glycerini, ...	f℥j	30.	Cc.	
Aquæ chloroformi, ... ad	f℥iij	90.	Cc.	M.

Sig.—One teaspoonful at meal-time, well diluted.

AMYLOID KIDNEY.

Synonyms. Chronic Bright's disease; waxy kidney; lardaceous kidney.

Definition. A peculiar infiltration into, or a degeneration of, the structure of the kidney, from the deposit of an albuminoid material, having a superficial resemblance to molten wax or boiled starch. Similar changes occur in the liver, spleen, intestines, and other organs.

Causes. The chief cause is prolonged suppuration, especially of the bones; coxalgia; syphilis; cancer; phthisis.

Pathological Anatomy. The kidney is uniformly enlarged. It presents a pale, glistening, translucent appearance, and has a doughy consistency. On section, the surface is homogeneous, anæmic, and whitish. The deposit occurs along the renal vessels and in the vascular tufts of the glomeruli, progressing until all parts of the organ are infiltrated. When the organ is thus infiltrated, the proper structure undergoes an atrophic degeneration, the result of pressure.

The reaction with iodine and sulphuric acid affords a certain test of the *amyloid* deposit. Brush over a section of the affected kidney a solution of iodine with iodide of potassium in water, when a mahogany color will be produced, and if diluted sulphuric acid is now added, a violet or bluish tint results. A very pretty reaction is to take a one per cent. solution of anilin violet, which strikes a red or pink color with the amyloid material, while the unaltered tissues are stained blue, making a beautiful contrast.

Similar changes occur in other organs of the body. With the amyloid change may be associated either parenchymatous or interstitial nephritis.

Symptoms. Associated with *wasting* are *œdema* of the lower extremities and *ascites*, with an *increased flow of urine*, pale, watery, and of low specific gravity, containing *albumin* and *hyaline casts*, which are transparent. If the amyloid change be associated with other forms of renal change, the urine will show the characteristics of such condition. A profuse, watery, and persistent *diarrhœa* caused by the amyloid changes in the intestinal canal.

Diagnosis. Differs from *parenchymatous nephritis* in its clinical history, and the fact of its always being associated with a suppurating disease.

From *interstitial nephritis*, in its history, character of the urine,

absence of uræmia, cardiac hypertrophy, changes in the vessels, and the fact of its association with suppurating diseases and similar changes in other organs.

Prognosis. Controlled by the suppurating disease with which it is associated; the termination, when the amyloid change is fully developed, is unfavorable, death occurring within a few months, or, under favorable conditions, not for one or more years.

Treatment. Sustaining and symptomatic in character. Generous diet and the persistent use of *ferri iodidum*, alternating with *ammonii chloridum* and *oleum morrhuæ*.

If caused by syphilis, a thorough course of *potassii iodidum*, *ferri iodidum*, and *hydrargyri corrosivum chloridum*, with *oleum morrhuæ*.

If of syphilitic origin, the plan of Keyes (Dr. E. L.) is to be commended: "A case treated from the first should receive mercury continuously in *small doses*, gr. $\frac{1}{50}$ to gr. $\frac{1}{35}$ (0.0015–0.002 Gm.), for a period not less than two and a half years, or, in any event, until at least six months have passed after the entire disappearance of the clearly syphilitic symptoms."

PYELITIS.

Synonyms. Suppurative nephritis; pyelo-nephritis.

Definition. An acute catarrhal inflammation of the pelvis of the kidney; the term *pyelo-nephritis* is used when suppurative inflammation is superadded to the catarrhal inflammation. The disease is characterized by lumbar pains, irritability of the bladder, the urine neutral or alkaline in reaction and milky in appearance; if *pyelo-nephritis* occur, symptoms of hectic fever and exhaustion are added, the urine containing pus.

Causes. Cold or exposure; cystitis; obstruction of the ureters by renal calculi; pressure from a tumor; prolonged use of bromides and other irritative drugs; rheumatism; sequelæ of infectious diseases.

Pathological Anatomy. The inflammation is *catarrhal;* it is characterized by injection of the mucous membrane of the pelvis of the kidney, with slight extravasations of blood; relaxation and softening, shedding of the epithelium, and the subsequent discharge of mucus and pus. If the morbid condition has existed for some time, the kidneys, one or both, are in a process of suppuration; they are

enlarged, deeply congested, except where suppuration is proceeding, when they are of a yellowish-white color—*pyelo-nephritis*. Pus is constantly forming, and if there be no obstruction, flows away with the urine; should there be an impediment to its escape, pus accumulates in the pelvis of the kidney, causing its distention, giving rise to the condition known as *pyelo-nephrosis*. The pressure caused by the obstruction finally leads to destruction of the entire organ, a mere sac, or *renal cyst*, remaining.

Symptoms. If caused by *cystitis*, symptoms of this condition occur first; if from *renal calculi*, its characteristic symptoms precede those of pyelitis.

Begins by *chilliness*, *feverishness*, *lumbar pains* following the course of the ureters, *frequent micturition*, the *urine milky* in appearance when voided, *acid* or *neutral* in reaction, and depositing a copious sediment, whitish or yellowish-white in color, containing only a small amount of albumin, no more than is due to the *pus*.

Cases of pyelitis due to renal calculi frequently show *hemorrhages*; the urine bloody after some extra exertion.

If *pyelo-nephritis* follow, symptoms of pyemia supervene, to wit: *fever*, typhoid in character, low, muttering *delirium*, *subsultus tendinum*, *stupor*, decline in strength, and loss of flesh, with perhaps a *tumor* in the lumbar region.

If both kidneys are affected, *uræmic* symptoms are frequent.

Diagnosis. From *cystitis*, by history, lumbar pains, and *acidity* or purulent urine, the urine in cystitis being always *alkaline*. A microscopical examination of the urine will aid the diagnosis very much.

Perinephritis, a disease of the loose tissue, around about the kidneys, terminating in abscess, causing lumbar pain, increased by motion or pressure, hectic fever, sense of fluctuation over kidneys, the *urine remaining normal*.

Prognosis. Simple cases, where no obstruction to flow of pus, *recover* in a week or ten days. If obstruction of the ureter, the prognosis is grave. Suppurative cases unfavorable.

Treatment. Rest in bed. Milk diet. Free use of water to dilute the urine, and free diaphoresis. *Quininæ sulphas* to keep down temperature, prevent formation of pus, and maintain the powers of life.

To change the character of the secretion, Prof. Da Costa strongly

recommends *pix liquida;* other remedies are *oleum santali, copaiba, eucalyptol, terebinthina,* and *cubeba.* I have seen excellent results from a prolonged course of the Buffalo Lithia Springs water or the Rockbridge Alum Springs water of Virginia.

For renal hemorrhage, *alumen,* gr. xx (1.3 Gm.), repeated p. r. n., is successful.

If *abscess* results, *aspiration, quininæ sulphas,* and *stimulants.* Extirpation of the diseased kidney has been followed with fair health.

ACUTE URÆMIA.

Synonyms. Uræmic poisoning; uræmic intoxication; uræmic coma; uræmic convulsions.

Definition. A group of nervous phenomena, which occasionally develop during the course of acute or chronic Bright's disease, and other maladies, the result of the retention or accumulation in the blood of an excrementitious material, supposed to be *urea,* the flow of urine being either normal, lessened, or increased.

Causes. Suppression of urine, from acute or chronic Bright's disease, probably more frequent in chronic parenchymatous nephritis; cystic, tubercular, or cancerous kidney; the puerperal state; operations on the uterus bladder, urethra, or rectum.

Symptoms. Uræmic intoxication is the result of the failure of the kidneys to perform their normal function of eliminating some one or all of the poisonous elements of the urine.

The toxæmia may develop suddenly, by a *convulsive* seizure followed by *coma,* or slowly and gradually. Usually the attack is preceded by a decrease in the urinary secretion and slight or marked œdema in various parts of the body; although it must be borne in mind that in rare instances, during, or immediately prior to, the appearance of the uræmic phenomena, the normal urinary flow has been largely exceeded.

The acute outbreak may manifest itself in a variety of ways.

Gastro-intestinal variety: The patient suddenly experiences attacks of *vertigo, pallor* of face, *nausea* and *vomiting,* with *fever,* the temperature varying between 100° and 103°, *pulse tense* and *rapid, respiration hurried,* and the *urine* scanty with low specific gravity; unless symptoms are promptly relieved, *convulsions* may occur, followed by *coma*

and death, or *drowsiness* supervenes, followed by coma, which is really nothing but a profound sleep. Rarely an acute maniacal outbreak follows the gastro-intestinal symptoms.

Convulsive variety. Without any appreciable prodromes, *epileptiform convulsions*, with or without loss of consciousness. The convulsions may consist of a single paroxysm, or a succession of fits may follow one another at intervals of a few minutes or several hours, the patient in a condition of more or less profound insensibility during the intervals. The fits closely simulate true epilepsy. In this variety the *temperature* is high, from 103° to 106° or more, the *pulse rapid*, with or without tension, the *respirations* quickened. *Coma* followed by death is a very common ending of this variety of uræmia, or after a profound sleep of hours the patient gradually recovers his usual health. Alcoholic excesses are responsible for many of these attacks.

Cerebral variety, or *uræmic coma*. Develops gradually, with an increasing *drowsiness*, associated with *headache* and irritability of temper (mild mania). *Nausea*, *vomiting*, and *rise of temperature*, often reaching 105°, rarely 107°, with rapid, full pulse, *or* the patient may fall suddenly into a condition of profound coma, the symptoms closely resembling an apoplectic stroke, excepting the high temperature. Uræmic coma is always accompanied with *rise of temperature* and *stertor*. "The stertor is peculiar; it is not the 'snoring' of apoplexy, but a sharp, hissing sound produced by the rush of expired air against the teeth or hard palate." (Loomis.) The respirations are accelerated, the pulse rapid but minus tension. This variety may suddenly terminate fatally with a convulsion, or a deepening coma with prostration and cold, wet skin, with œdema of the lungs, or, rarely, gradual recovery.

Diagnosis. Uræmic conditions closely resemble a number of conditions in which convulsions and coma are prominent symptoms. Much valuable assistance is obtained by a knowledge of the condition of the kidneys. Always obtain a specimen of urine at once and subject to an albumin test at least.

Another valuable aid is the temperature record. I believe acute outbreaks of uræmia are always associated with a rise of temperature. The temperature is the result of the irritation of the heat-centres and not due to an increased arterial pressure.

Cerebral apoplexy may be mistaken for uræmic coma, or the re-

verse. The chief points of distinction are that in the latter the attack is usually in patients suffering from dropsy, and that the coma is not sudden in its appearance, but is generally preceded by other nervous phenomena, such as headache, vertigo, dimness of vision, obstinate vomiting, and convulsions. Again, the *uræmic stertor* is a sharp, hissing sound, while that of apoplexy is "snoring." Apoplexy is followed by paralysis; uræmic coma is not.

An *epileptic* seizure is preceded by a sharp cry and extreme pallor of the face, the countenance being dusky in uræmic convulsions.

Prognosis. An attack of acute uræmia is always a very grave condition. The prognosis depends upon the amount of retained poison, the length of time it has been retained, and the condition of the organs of elimination.

Treatment. Promptness and thoroughness is the essential point in the treatment of a uræmic outbreak.

For the gastro-intestinal variety, put patient to bed and administer the magnesium sulphate enema given below, and order either *caffeinæ citrata*, gr. iij (0.2 Gm.), every three hours, or the spartein and pilocarpine mixture mentioned below. As soon as the secretions have been started, give one of the following powders every two hours until a dozen or more are used, followed by Hunyadi Janos water:

℞. Hydrargyri chlor. mitis, ...	gr. ¼–½	.016–.032	Gm.
Sodii bicarb., ...	gr. ij	.130	Gm.
Pulv. ipecacuanhæ, ...	gr. ⅙	.011	Gm. M.

Ft. chart. No. j.

For the convulsive or cerebral variety, the indications are: *first*, to arrest the nervous phenomena; *secondly*, to promote elimination. Prof. Loomis has succeeded in meeting both of these conditions by hypodermic injections of *morphinæ sulphas*, gr. ⅙–¼–½ (0.011–0.016–0.032 Gm.), repeated, if required, every two hours. He says: "The most uniform effect of morphine so administered is, first, to arrest muscular spasms; second, to establish profuse diaphoresis; third, to facilitate the action of cathartics and diuretics, especially the action of digitalis."

Following the injection of morphina, *diaphoresis* should be promoted by means of the *hot-air bath*, or the *hot wet pack*, or the hypodermic use of *pilocarpinæ hydrochloras*, gr. $\frac{1}{12}$–⅙–¼ (0.005–0.011–0.016 Gm.), provided no counter-indication to its use exists, or using at the same time frequent doses of *caffeinæ citrata*, gr. iij (0.2 Gm.).

The following combination has given excellent results in a number of cases when the patient was able to swallow:

℞. Sparteinæ sulphat., ... gr. iv .265 Gm.
Pilocarpinæ hydrochlor., ... gr. j .065 Gm.
Infus. digital., ... f℥ij 60. Cc. M.

Sig.—Teaspoonful every half hour, hour, or two hours until effect.

Spiritus glonoini added to the above combination is valuable.

If patient is unable to use the medicine by stomach, the same drugs can be used by the hypodermic method, using digitalinæ cryst.:

℞. Digitalinæ cryst., ... gr. $\frac{1}{64}$ .001 Gm.
Pilocarpinæ hydrochlor., ... gr. ¼ .016 Gm.
Sparteinæ sulph., ... gr. ½ .032 Gm.
Aquæ destil., ... ♏xv 1. Cc. M.

Sig.—As dose p. r. n.

Or—

℞. Pilocarpinæ nitrat., ... gr. ij .13 Gm.
Unguent. petrolei, ... f℥j 30. Gm. M.

Sig.—Apply (rubbed) bis die over kidneys.

I have never observed the alarming symptoms of depression mentioned by some observers from the careful use of pilocarpus.

The production of free diaphoresis alone must not mislead, for unless the sweat contains urea or its products it is only depressing, and the clinical fact is that in uræmia the eliminating function of the skin as well as of the kidney is in abeyance.

The *convulsions* are rapidly controlled by inhalations of *chloroform* (although the after symptoms are badly influenced by the drug), or the internal or rectal administration of full doses of *chloral*, or by a free *venesection*. Indeed, venesection is too much neglected in conditions of coma and uræmic convulsions. It not infrequently happens that upon opening a vessel the blood does not flow, or but a few drops slowly flow from the wound. If this obtains it is almost immediately changed by a hypodermic injection of *amyl nitrite*, ♏v (0.3 Cc.) with *spiritus ammoniæ aromaticus*, ♏xv (1 Cc.).

Diuresis is promoted by *infusum digitalis*, dry or wet cupping, poultices over the loins, and hot compresses of infusum digitalis over abdomen, pilocarpus rubbed over the kidneys, or *caffeinæ citrata*, or *sparteinæ sulphas*, or *spiritus glonoini*. The injection of the normal salt solution, ℥j : Oj (4 Gm.: 473 Cc.), into the bowel every

hour or two, and by hypodermoclysis into the loose connective tissue, promotes diaphoresis and diuresis. Excellent results have been obtained in uræmia with scanty urinary secretion and in other conditions with scanty urine with *diuretin* (a mixture of salicylate of soda and theobromin) in gr. xx–xxx (1.3–2 Gm.) in an ounce of water every two or four hours.

Catharsis is best promoted by *elaterium*, gr. $\frac{1}{12}$–$\frac{1}{8}$ (0.005–0.008 Gm.), or an Epsom salts enema:

℞. Magnesii sulph., ... ℥ij 60. Gm.
Glycerini, ... ℥j 30. Cc.
Aquæ bul., ... ℥iv 120. Cc. M.
As enema.

The febrile reaction does not call for antipyretics. It is one of the nervous phenomena of uræmia, and is controlled by the means employed to eliminate the poison.

If symptoms of collapse develop, with cold, clammy skin, feeble, rapid pulse, and superficial respirations, at once administer *atropinæ sulphas*, gr. $\frac{1}{64}$ (0.001 Gm.), repeat p. r. n., and *strychninæ sulph.*, gr. $\frac{1}{32}$–$\frac{1}{16}$ (0.002–0.004 Gm.), repeated p. r. n., with ♏ij (0.12 Cc.) *spiritus glonoini*, and bathe surface with hot water and alcohol.

Of late, *sodii benzoas*, ʒj–ij (4–8 Gm.) during the twenty-four hours, has been lauded as almost a specific in uræmic intoxication. Under the action of this remedy the paroxysms lessen in severity, the intervals grow longer, and the convulsions after a time cease entirely. Profound sleep is induced by it, and during this the cerebral functions are restored. When albuminuria exists, a marked diminution occurs in the quantity present, or the albumin disappears entirely.

Milk, in as large quantities, diluted as can be borne, should be the diet. The attack broken, the treatment resolves itself into that of the nephritic affection causing it.

RENAL CALCULI.

Synonyms. Nephro-lithiasis; gravel; renal colic.

Definition. *Renal calculi* are concretions formed by the precipitation of certain substances from the urine, around some body or substance acting as a nucleus.

Their presence may not be recognized until one or more attempts to pass along the ureters, when an attack of *renal colic* results; or, by irritation, *pyelitis* is produced; or, more rarely, they are voided by the urine without exciting any symptoms.

By *gravel* is meant very small concretions (sand), which are often passed in the urine in large numbers.

Causes. Occur at all ages; frequent at forty to fifty years of age. Males are more liable than females. A special liability seems to exist in some families, but the precise etiology of calculi is not yet determined.

Varieties. 1. *Uric acid*, as calculi and gravel, and especially associated with the gouty diathesis.

2. *Urates*, chiefly urate of ammonium; nearly always in childhood,

3. *Oxalate of lime* or mulberry calculus; characterized by hardness, roughness, and very dark color.

4. *Phosphatic calculi* form as frequently in the bladder as in the kidney, and present a chalky or earthy appearance.

5. *Alternating calculi*, consisting of alternate layers of two or more primary deposits.

Anatomical Characters. In structure, a urinary calculus usually consists of a *central nucleus*, surrounded by the *body*, and outside of all there may be a phosphatic *crust*. The nucleus may or may not be of the same material as the rest of the stone, sometimes being a foreign body, mucus, or blood.

A section generally shows a *stratified* arrangement, or it may be partly or completely *radiated*.

Symptoms. Many individuals have renal calculi and have no suspicion of their presence until an attack of renal colic occurs.

The following signs indicate a renal stone: *pain* in back, principally in either dorso-lumbar region with tenderness; *renal hemorrhage* (hæmaturia), always a valuable symptom; slight *albuminuria*, but no pus, with a few *hyaline casts*—these are long and narrow; urine of *high* specific gravity is an important clinical symptom; *inflammation* terminating in *abscess*, *pyelitis* or *pyelo-nephritis*, *cystitis*, or *renal colic*.

The symptoms of *renal colic* begin abruptly, by severe, agonizing, *pain* in the lumbar region following the ureters into the corresponding groin and thigh. *Pain* and *retraction* of the corresponding testicle; also of glans penis. *Face pale* and *features pinched*, the surface cold

and damp. Irritability of the bladder, the urine passing in drops containing some blood. So severe is the pain at times that the patient may faint or pass into unconsciousness, or have a general convulsion. If both ureters are obstructed, *uræmic symptoms* occur.

The paroxysm usually terminates suddenly after some minutes or hours, the stone escaping into the bladder.

Diagnosis. Not always easy, but the following are symptoms of renal stone; pain and tenderness in back, persistent hæmaturia, albuminuria, hyalin casts, and high specific gravity of urine, and attacks of renal colic. The Roentgen ray is the hope for correct diagnosis.

Prognosis. Renal calculus is attended with many dangers. It may produce extensive disorganization of the kidneys, or its passage along the ureter may prove fatal. If the stone be very large, or if more than one, the prognosis is graver. Calculus is a disease very apt to recur. Renal sand (*gravel*) and small concretions may, after more or less delay, be voided with the urine.

Treatment. An attack of *renal colic* is best relieved by a hypodermic injection of *morphinæ sulphas* and *atropinæ sulphas*, and a warm bath or a suppository of *ext. opii*, gr. j (0.065 Gm.), *ext. belladonnæ alco.*, gr. ss (0.032 Gm.), repeated if needed.

For attacks of *gravel*, *liquor potassii citratis*, f℥ss (15 Cc.), every two hours, and, if much *vesical irritability*, adding *tinctura opii camphorata* f℥ss–j (2–4 Cc.).

For *renal hemorrhage*, Prof. Bartholow reports success with

℞. Extracti ergotæ fluidi,
Tincturæ krameriæ, ... āā f℥ij 60. Cc. M.
Sig.—One teaspoonful every two or more hours.

I have always successfully controlled renal hemorrhages with twenty-grain (1.3 Gm.) doses of *alumen*, repeated p. r. n.

For *uric acid calculi*, as a solvent, Buffalo Lithia Springs water or the Rockbridge Alum Springs water of Virginia, or *potassii tartraborates*, "obtained by heating together four parts of cream of tartar, one part of boracic acid, and ten parts of water. A scruple may be given three or four times a day, in water, largely diluted."

I have met with entire success in four cases of renal calculi by the prolonged use of *piperazine* gr. v (0.32 Gm.), three times a day in several ounces of water, with a non-nitrogenized diet. Potter sug-

gests the following in the uric acid diathesis with a tendency to formation of renal calculi:

℞.	Magnesii carbonat., ... ʒj	4. Gm.	
	Acid. citrici, ... ʒij	8. Gm.	
	Sodii borat., ... ʒij	8. Gm.	
	Aquæ bullientis, ... ʒviij	240. Cc.	M.

Sig.—Tablespoonful three times daily, diluted.

For *phosphatic calculi*, as a solvent, *ammonii benzoas*, well diluted and long continued is highly commended.

CYSTITIS.

Synonym. Catarrh of the bladder.

Definition. An inflammation of the mucous membrane lining the urinary bladder, acute or chronic in its course, and of either a catarrhal, croupous, or diphtheritic character; characterized by rigors, moderate fever, hypogastric pain, frequent but scanty micturition, and severe vesical tenesmus, the urine containing pus (pyuria).

Causes. *Acute variety:* long retention of urine; foreign bodies in the bladder; pyelitis; urethritis; blows over the pubes; myelitis, and secondary to fevers or diphtheria. *Chronic variety:* following the acute variety; retention the result of enlarged prostate or a urethral stricture; calculi; gout; chronic Bright's disease.

Pathological Anatomy. In *acute catarrhal cystitis* there first ensues hyperemia of the mucous membrane of the entire or a portion of the bladder, manifested by redness, swelling, and œdema; followed by an increased secretion of the small glands at the base of the bladder, and an increased growth and consequent desquamation of the vesical epithelium, together with a copious generation of young cells; if the hyperemia be decided, rupture of the capillaries and extravasation of blood occur.

If the inflammation be intense, suppuration of the submucous connective tissue may result, and ulceration of the mucous membrane permit the submucous abscesses to empty into the bladder.

If the inflammation be of a croupous or diphtheritic character, the morbid anatomy does not differ from the same variety of inflammations in other mucous membranes.

In *chronic cystitis* "the mucous membrane is thick, blue-gray in color, and very tough. Muco-pus and viscid mucus are formed in large quantities upon its surface. The muscular wall of the bladder may sometimes be half an inch thick, and the fasciculi give a ribbed appearance to the internal surface, called the 'columnar bladder.' The hypertrophy of chronic cystitis may be eccentric or concentric. In some cases diverticuli are formed, in whose walls are dilated and tortuous veins. In nearly all cases bacteria are found in abundance." (Loomis.)

Symptoms. *Acute cystitis:* The onset is usually abrupt, by *rigors*, slight *fever*, loss of appetite, sleeplessness, a feeling of depression, *frequent micturition*, though the *urine* is only voided drop by drop, and its passage followed by distressing *vesical tenesmus*, the result of spasm of the bladder; *pain* over the pubis and in the iliac regions, of a dull character, at times becoming sharp and agonizing. *Burning along the urethra* adds to the distress of the patient.

The *urine* is cloudy, of an *alkaline* reaction, and at times is *fetid*, the microscope showing *epithelium*, *pus*, and *red blood corpuscles* and various forms of bacteria.

Chronic cystitis: The onset is gradual and insidious, and is excited by some obstacle to the evacuation of the urine, such as stricture, the presence of a stone in the bladder, or enlargement of the prostate gland. There are present dull *pain*, *frequent* but *scanty micturition*. The *urine* is *alkaline*, containing large amounts of *muco-pus* or *pus*; on standing it deposits a thick, glairy, viscid sediment, in which, under the microscope, triple phosphates and large pus corpuscles, extremely regular both in contents and in shape, may be detected.

Although the quantity of urine voided by the patient is small, yet if immediately after micturition the catheter is used, several ounces of *fetid*, *cloudy*, *alkaline urine* may be removed.

Patients with chronic cystitis usually present decided constitutional debility and mental depression.

Severe local pain, emaciation, and occasional bloody urine indicate ulceration of the vesical mucous membrane.

Diagnosis. *Pyelitis* has lumbar pains following the course of the ureters, frequent micturition without the severe vesical tenesmus; the urine, although cloudy, has an acid or neutral reaction.

Prognosis. The *acute variety* is, as a rule, good, being controlled by the cause.

The *chronic variety* continues for years, and after hypertrophy of the bladder is incurable.

Treatment. Rest in bed is invaluable. The diet must be restricted, all highly-seasoned articles being particularly interdicted; milk is the most suitable article.

Warm applications over the pubic region are of benefit, and leeching and cupping over the bladder are of service.

The urine should be well diluted by large draughts of pure water, and particularly the alkaline mineral waters, to wit: Farmville lithia, Buffalo lithia, Rockbridge alum, or Vichy waters. The following formulæ are of decided benefit:

℞. Acidi benzoici,
Sodii borat., ... āā ʒij āā 8. Gm.
Infusi buchu, vel
Infusi uvæ ursi, ... fʒvj 180. Cc. M.
SIG.—Tablespoonful every two hours, well diluted.

Or—

℞. Tinct. hyoscyami, ... fʒvj 24. Cc.
Tinct. opii camph., ... fʒvj 24. Cc.
Potassii bromidi,
Sodii bicarb., ... āā ℈viij āā 10.5 Gm.
Liq. potassii citrat., . . . q. s. fʒviij q. s. 240. Cc. M.
SIG.—Tablespoonful every two or three hours, in water.

A valuable prescription is—

℞. Ext. pichi fld., ... fʒj 30. Cc.
Potassii nitrat., ... ʒj 4. Gm.
Elix. simplicis, ... fʒiij 90. Cc. M.
SIG.—One teaspoonful every two hours, well diluted.

Or—

℞. Liq. potassæ (B. Ph.), ... fʒij 8. Cc.
Ol. santal. flav., ... fʒij 8. Cc.
Aq. cinnamom., ... ad fʒviij 240. Cc. M.
SIG.—Tablespoonful three times daily, diluted. (Saundby.)

For alkaline urine from any cause, *ammonii benzoas*, gr. xx (1.3 Gm.) in water, or liquor potassii citratis, seems like a specific.

For the *pain* and *tenesmus* relief is afforded by a suppository of *extractum opii* and *extractum belladonnæ*, repeated as needed. Hot compresses over bladder and hot enemata often relieve the pain of cystitis.

The *vesical tenesmus* is often benefited by *extractum cannabis indicæ fluidum*, ♏xv–xxx (1–2 Cc.), every three or four hours.

Chronic cystitis. The bladder should be completely emptied with the catheter several times in the twenty-four hours.

The use of *eucalyptol*, gtt. x–xv (0.6–1 Cc.), every four hours, well diluted, or a good preparation of *tar*, or *extractum grindeliæ fluidum*, ♏xx–fʒj (1.3–4 Cc.), three or four times daily, or *oleum santali*, gtt. v–x (0.3–0.6 Cc.), in emulsion or capsule after meals, are valuable remedies. *Acidum boricum*, gr. v–xv (0.3–1 Gm.), internally, has removed pus from the urine in chronic cystitis. Washing out the bladder with the following mixture is of decided benefit:

℞.	Sodii borat., ...	ʒj	30. Gm.
	Glycerini, ...	fʒij	60. Cc.
	Aquæ, ...	fʒij	60. Cc.

Sig.—One to two tablespoonfuls added to warm water and injected into the bladder once or twice daily.

The diet should be nutritious and without spices of any kind. The free use of the alkaline mineral waters is of value.

MOVABLE KIDNEY.

Synonyms. Floating kidney; wandering kidney; nephroptosis.

Definition. A condition of the kidney, either congenital or acquired, in which the tissues around about the organ are so lax and the renal vessels so elongated as to permit the kidney to be moved in certain directions, causing a movable tumor in the abdomen.

Causes. The kidney is normally held in position by the layer of peritoneum which is attached to the anterior surface of its adipose capsule. In movable kidney the adipose tissue, in which the normal kidney is imbedded, partly or wholly disappears.

The renal vessels are in many cases abnormally long. Relaxation of the abdominal walls from pregnancy or other causes. The use of tight corsets or girdles about the waist; violence; increased weight of the organ from disease; the pressure of tumors growing in the neighborhood of the kidney; the traction of herniæ.

The condition may be congenital or acquired, more frequently the latter. It is far more frequent in women than in men.

Symptoms. Floating kidney may, and often does, exist without any noticeable symptoms, the condition being unknown until accidentally discovered by the physician while making a physical examination of the abdomen.

As a rule, however, patients experience a heavy, dragging pain in the abdomen, aggravated when walking or standing. There are also present gastro-intestinal symptoms, more or less constant, with melancholia, aggravated by the mental anxiety the presence of a *tumor* in the abdomen causes the patient, in spite of the assurances of the physician that it is not a cancer.

At times, from some unknown or unrecognized cause, the movable kidney swells and becomes very sensitive to the touch, and migrates a considerable distance from its normal position. Such an occurrence aggravates all the former symptoms mentioned. The condition has been ascribed to a twisting of the ureter and consequent retention of the urine in the pelvis of the kidney, or to localized peritonitis, or to a partial strangulation of the kidney from compression or twisting of its blood-vessels.

Hysterical (?) symptoms are frequently observed in women suffering from wandering kidney.

Diagnosis. The possibility of dislocation of the kidney is to be recollected in determining the nature of obscure tumors within the abdomen.

The late Prof. Austin Flint based the recognition of this variety of abdominal tumor on the following diagnostic points: "It is situated in the hypochondriac region. It has the size and shape of the normal kidney, and this may be determinable by palpation, which is most advantageously employed by placing one hand over the lumbar region and the other in front on the abdominal walls, and then making counter-pressure from one hand to the other. It is generally movable, and in some cases the organ can be restored to its proper situation."

Other tumors are to be excluded by the absence of their diagnostic characters.

Prognosis. It is a rare occurrence to have a fatal termination from movable kidney *per se*.

Treatment. Symptomatic. It is said that some of the inconvenience and sometimes suffering attending movable kidney may be lessened by means of an abdominal bandage, belt, or supporter.

If attacks of pain and swelling occur, the patient should be placed

in bed, have hot applications over the abdomen, and the use of opiates and attempts at replacing the organ.

Extirpation of a movable kidney has been successfully performed a number of times.

Nephrorrhaphy, an operation for fixation of the kidney by means of sutures, has been devised.

DISEASES OF THE BLOOD.

ANÆMIA.

Synonym. Spanæmia.

Definition. A deficiency of red corpuscles in the blood, or of its more important constituents, such as albumin and hæmoglobin, or a reduction in the amount of blood as a whole; characterized by pallor and general weakness.

Oligæmia is a general lessened amount of the blood. *Ischæmia* is a localized anæmia.

Causes. *Predisposing:* Sex; females, pregnancy and menopause; heredity; pronounced anæmia without apparent cause is strongly suspicious of concealed tuberculosis.

Exciting: Deficient food, air, or sunshine; excessive work; mental worry; mental shock; prolonged and frequent nocturnal emissions; excessive nursing; chronic intestinal catarrh; Bright's disease; malaria; syphilis; cancer.

Pathological Anatomy. *Post-mortem*, the tissues are thin, shrunken, and bloodless. If the anæmia has been of long duration, patches of fatty change are seen in the various organs. The blood has a brighter color, the result of diminution in the number of red corpuscles and the quantity of the hæmoglobin; it is thinner than normal, and coagulates slowly and imperfectly, from diminution of the fibrino-plastic constituent.

In health the blood of an adult contains about five million red corpuscles to the cubic millimeter (the female adult about half a million less). The white cells, in health, average about ten thousand to the cubic millimeter.

Symptoms. *Pallor*, gums, tongue, ear, and conjunctivæ pale. *Muscular weakness*, inability for exertion. *Deficient appetite* and *impaired digestion*, attacks of *vomiting* the result of anæmia of the medulla oblongata. *Quickened respiration*, *irritable temper*, *vertigo* in the erect position, attacks of *swooning*, *hysteria*, and rarely *epilepsy*. *Irritable heart*, with soft *systolic basic murmurs*. Nocturnal emissions in male and deficient menses in female. *Marasmus* in children. More or less general *œdema* of the eyelids and ankles. Long continued, symptoms of fatty changes in various organs or gastric ulcer result.

Diagnosis. The symptoms of anæmia are so characteristic that an error is impossible; the cause of it, however, may be hidden.

Prognosis. Favorable if treated early. If protracted, results in more or less general symptoms of fatty degenerations or ulcer of the stomach.

Treatment. Remove the cause. Easily assimilated, blood-producing diet. Fresh *air*, *sunlight*, and *exercise* short of fatigue, The anæmic patient should spend several hours in bed during the daytime. Purgatives, with stomachic tonics, to promote digestion.

For the anæmia proper, *ferrum* in some form is the most valuable remedy, always remembering that it is not assimilated if the intestines and liver be torpid. *Ferri carbonatis*, gr. ij–v (0.13–0.32 Gm.), is an excellent form of iron too little employed.

The following alterative tonic, known as Smith's (Dr. A. H.) "four chlorides," is frequently of value:

℞.	Hydrargyri chloridi corrosivi, . .	gr. j–ij	.065–.13	Gm.	
	Liq. arsenici chloridi, ...	f℥j	4.	Cc.	
	Tinct. ferri chloridi,				
	Acidi hydrochlorici dil., . . .	āā f℥iv	āā 15.	Cc.	
	Syrupi, ...	f℥iv	15.	Cc.	
	Aquæ, ...	ad f℥vj	180.	Cc.	M.

Sig.—One dessertspoonful in a wineglassful of water after each meal.

Cases of anæmia with weak stomach can take the following "iron lemonade" with ease:

℞.	Tinct. ferri chloridi, ...	f℥ij	8.	Cc.	
	Acid. phosphor. dil., ...	f℥ij	8.	Cc.	
	Syr. limonis, ...	f℥ss	15.	Cc.	
	Aquæ, ...	f℥ij	60.	Cc.	M.

Sig.—One teaspoonful, well diluted.

CHLOROSIS.

Synonyms. Essential anæmia; green sickness.

Definition. A pronounced anæmia met with chiefly in young girls about the age of puberty, characterized by diminution in the percentage of hæmoglobin.

Causes. The true cause unknown. A disease for the most part of puberty. Most frequently seen in the ill-fed, overworked town girls, who are deprived of sunshine and fresh air. Heredity is supposed to play a part in its causation. Hammond maintains "that it is an affection of the nervous system, the blood changes being secondary."

Pathological Anatomy. Death from chlorosis is such a rare occurrence that little data is known. The number of red corpuscles is nearly normal, but there is marked decrease in the hæmoglobin, sometimes as low as twenty per cent. of the normal, or even less. Virchow pointed out the hypoplasia of the arterial system, many arteries being congenitally small. The body is usually well nourished and the subcutaneous fat well distributed. There is pallor of the organs and muscular system. The spleen, lymphatics, and the marrow of the bones are not affected.

Symptoms. The condition is associated with disorders of menstruation. The young girl experiences a *change of disposition*, becoming *morose* and *despondent*, rarely *hysterical* or melancholiac.

"As respects the actual condition of the sexual organs, there are two forms of derangement which happen in chlorosis: there are the *amenorrhœic* form and the *menorrhagic* form."

After an attack of menorrhagia or after the failure of the flow to appear, the changes occur. The complexion changes, *blondes* becoming pallid, waxy, and puffy without œdema; *brunettes* becoming muddy and grayish in color, with bluish-black rings under the eyes. Weariness and fatigue upon the least exertion; the heart irritable, with shortness of breath, pulse full but soft, and at times pulsations in the peripheral veins. The appetite is vitiated, the digestion imperfect; and attacks of gastralgia are frequent.

A not infrequent complication is *gastric ulcer*. Phthisis develops in those having the slightest predisposition.

Examination of the blood shows a relative decrease in quality and

quantity of the hæmoglobin, resulting in the blood being paler than normal. The red corpuscles are also lighter in color and show less tendency to form rouleaux; their character also changes, not all being of uniform size, some normal, others small (microcytes), others unusually large (macrocytes), others irregularly shaped (poikilocytes). The number may be normal, 5,000,000 to the cubic millimeter, or the number is occasionally increased, but it is usually lessened, there being as few as 3,000,000 or 2,000,000.

The white corpuscles are usually normal in number, but in some instances their number is increased (leucocytosis). Rarely granular bodies are found in the blood which are generally regarded as the products of the degeneration of the white blood corpuscles.

Diagnosis. The disease is usually recognized at once by the color of the patient, whence its common name, green sickness.

The circulatory symptoms and slight œdema may be mistaken for cardiac or nephritic diseases.

Prognosis. The liability to complications and also to relapses, and the lack of knowledge of the true cause, make the prognosis always uncertain.

Treatment. Three indications to be met in the treatment of chlorosis: plenty of food, fresh air, and ferrum. The form of iron is immaterial. The *tinctura ferri chloridi* is the preparation usually prescribed.

J. W. England, Ph.G., has proposed the following formula for an iron pill that has been successfully used at the Philadelphia Hospital:

℞.	Massæ ferri carb., ...	gr. xlviij	3. Gm.	
	Potassii sulph., ...	gr. xxxiv	2. Gm.	
	Potassii carb., ...	gr. v½	.33 Gm.	
	Pulv. altheæ, ...	gr. iss	.02 Gm.	
	Pulv. acaciæ, ...	q. s.	q. s.	M.

Ft. pil. No. xvj, and inclose in gelatin capsules.

The following is *Blaud's* formula, so highly lauded by Niemeyer:

℞.	Pulv. ferri sulph.,			
	Potassii carbonat. puræ, . .	āā ℥ss	āā 15. Gm.	
	Tragacanthæ, ...	q. s.		M.

Ft. pil. No. xcvj.

Sig.—One to three or four pills three times daily.

In some instances *ferrum* alone does not seem to answer; in such cases the addition of *arsenicum* is valuable; a good combination is—

℞. Ferri arseniatis, ... gr. $\frac{1}{12}$–$\frac{1}{6}$ .005–.011 Gm.
Ext. nucis vomicæ, ... gr. $\frac{1}{6}$–$\frac{1}{4}$ .011–.016 Gm. M.
Ft. pil. No. j.
Sig.—After meals.

Or—

℞. Liq. arsenici chloridi, ... f℥ij 8. Cc.
Tinct. ferri chloridi, ... f℥vij 28. Cc.
Glycerini, ... f℥j 30. Cc.
Elix. aurantii, ... q. s. ad f℥iij 90. Cc. M.
Sig.—One teaspoonful after meals, in water.

PROGRESSIVE PERNICIOUS ANÆMIA.

Synonyms. Idiopathic anæmia; anæmatosis; essential anæmia; anæmia of fatty heart.

Definition. A pernicious, progressive form of anæmia, of unknown cause, usually resisting all treatment, and toward its termination associated with fever.

Causes. The underlying cause of idiopathic anæmia is not known. Among the exciting causes may be mentioned pregnancy, syphilis, and great worry. It is thought that it is probably the result of a *toxin*.

Pathological Anatomy. The blood is scanty and pale, with diminished red corpuscles and hæmoglobin, showing a very feeble tendency to coagulate. There is no increase in the white corpuscles.

The *marrow* in adult bones becomes fœtal, red, and adenoid, and contains microcytes; several other changes have occurred secondarily in the marrow.

Secondary to the anæmia, the heart, larger arteries, and certain capillary tracts exhibit circumscribed or diffused fatty degeneration.

The liver, spleen, kidneys, and stomach are decidedly anæmic, causing fatty changes in those organs. The skin may contain petechiæ of a purplish or brownish tint, and internal hemorrhages are not infrequent; retinal hemorrhage is rarely wanting.

There is not much emaciation, though the pallor is pronounced.

Symptoms. It begins insidiously with increasing *languor* and *pallor*, the *muscular weakness* compelling the patient to take his bed. *Cardiac palpitation*, *dyspnœa*, attacks of *syncope*, *œdema*, and swelling about the ankles, *petechial* spots scattered irregularly over the surface; tenderness over the sternum and other superficial bones is a frequent symptom.

The appetite is wanting, and nausea and vomiting occur, associated with marked *dyspepsia* and persistent *diarrhœa*. As the disease progresses a remittent form of *fever* develops, the temperature frequently showing 102°–104° F.

Disorders of vision are the result of the *retinal hemorrhage*. The cardiac sounds are feeble, and associated with soft basic or anæmic murmurs.

The *blood* shows under the microscope the changes described in chlorosis, save the red corpuscles may be reduced to as few as 500,000, or even less, to the cubic millimetre.

"In addition, the following points of great diagnostic importance are to be noted.

"First, the individual red corpuscles are richer than normal in hæmoglobin.

"Second, many red corpuscles are larger than normal (megalocytes).

"Third, the red corpuscles are deformed, some being ovoid, others irregular in shape from projections and constrictions on their surfaces (poikilocytes).

"Fourth, there are present microcytes or red blood-cells, which are smaller than normal.

"Fifth, nucleated red blood-cells (normoblasts).

"Sixth, quite constantly, there are other large cells like the megalocytes, named megaloblasts, which have a pale staining nucleus." (Hare.)

Diagnosis. Progressive pernicious anæmia is distinguished from simple anæmia and chlorosis by the greater severity of the former. From leucocythemia by the normal-sized spleen and liver, and the absence of (leucocytosis) increase in the white corpuscles.

Prognosis. Unfavorable as a rule, although recoveries occur, but relapses frequent.

Treatment. The employment of *arsenicum*, either alone or combined with *ferrum*, has considerably changed the prognosis of per-

nicious anæmia. The arsenicum must be pushed to the extreme point of toleration and continued for a long time.

Rest in bed and a liberal nutritious diet are also essential.

LEUCOCYTHEMIA.

Synonyms. Leucæmia; white cell blood; white blood; anæmia splenica.

Definition. A condition in which there is an enormous increase in the number of white blood corpuscles, with enlargement of the lymphatic glands, spleen, and often of the bone marrow—viz.: *splenic*, *lymphatic*, or *myelogenic*, and is characterized by symptoms of pronounced anæmia.

Causes. The real cause and nature of the affection is unknown.

Pathological Anatomy. The *spleen* is increased in size, density, and firmness; the *lymphatic glands* all over the body also enlarge, but are soft to the touch, often fluctuating; the *marrow of the bones* changes from its normal rose color to that of a greenish-yellow; the *liver* also enlarges enormously. The *blood* is paler than normal, its specific gravity reduced from 1.055 to 1.040 or lower, and the *white corpuscles* increased (leucocytosis) in number and in size, the *red corpuscles* being lessened in number and size.

Symptoms. The onset is insidious, and the early progress of the disease is identical with that of simple anæmia, accompanied by *swelling* of the *abdomen* and a feeling of *fullness* and *pain* in the *splenic region*, due to the enlargement of that organ.

In the *lymphatic variety*, enlargement of the glands in the groin, neck, and axillary region are associated with the *great pallor*.

In the *myelogenic variety*, the bones, more particularly the ribs and sternum, are tender on pressure, the patient developing a waxy appearance.

In each variety the appetite is poor, the digestion feeble, the bowels loose, the patient easily fatigued, with cardiac palpitation and dyspnœa, with œdema of the eyelids and ankles. The urine is scanty and of high specific gravity—1.020–1.030. Fatal hemorrhages occur near the termination of the disease.

The *blood* is pale and watery. The white blood corpuscles are enormously increased in number. The average number of white

corpuscles to the cubic millimetre normally is about 10,000. Cases are recorded in which the number of white blood corpuscles has equaled or even exceeded the red blood corpuscles. The size of the white corpuscles varies in different cases and also in the same case.

Diagnosis. This should cause but little trouble if enlarged spleen, lymphatic glands, and tender bones are associated with great pallor, and the characteristic appearance of the blood as demonstrated by a "puncture of the finger of the patient, and receiving the blood on a piece of white linen or a lawn handkerchief, and placing by the side of it a similar stain of blood from a healthy subject. The full color of the latter contrasts strikingly with the stain of the former, which is hardly of a blood color and translucent."

A microscopical examination and blood count at once determines the presence of the disease.

Acute phthisis associated with enlarged bronchial and cervical glands shows the leucocytosis of leucocythemia, but has the lung changes and hectic symptoms in addition.

Prognosis. Unfavorable. The average duration is between two and three years. Cases of what are termed "acute leukæmia," proving fatal in a few months, occur.

Treatment. Symptomatic. A combination of the following remedies, with generous diet, fresh air, sunshine, pleasant surroundings, *oleum morrhuæ*, and the *hypophosphites*, have at times seemed of temporary value—to wit: *quininæ sulphas*, *arsenicum*, *ferrum*, and *ergota*.

Dr. Da Costa has had some success by the inhalation of *oxygen*, twenty to one hundred liters during the day.

HODGKIN'S DISEASE.

Synonyms. Pseudo-leukemia; Pseudo-leucocythemia; lymphatic anæmia; lymphadenoma.

Definition. An affection characterized by hypertrophy of the lymphatic glands in various parts of the body, associated with marked anæmia.

Cause. Unknown.

Pathological Anatomy. A hyperplasia of the lymph glands interfering more or less with their functions. The enlargement may be confined to one isolated gland, or a number may be affected in

different portions of the body, or a number in one location may be simultaneously affected, causing a tumor varying in size from an egg to an orange or even larger.

The spleen and liver are involved in two-thirds of the cases. "The marrow of the long bones may be converted into a rich lymphoid tissue." (Osler.)

The red blood corpuscles are decreased in number and altered in size and shape; the white blood corpuscles are often increased in number.

Symptoms. A slowly developing anæmia with isolated or diffused enlargement of the lymphatic glands. As the condition develops, fever of a remittent character occurs, with feeble cardiac action and shortness of breath. Hemorrhages may occur. The patient grows progressively worse with all the associated symptoms of deficient blood, death occurring by asthenia.

Diagnosis. A study of the clinical history will prevent error, as tubercular or scrofulous glands are accompanied with tubercular changes in the lungs, and do not present the same blood-changes as Hodgkin's disease.

Prognosis. Unfavorable. The progress may be slow, but it is none the less toward a fatal termination.

Treatment. The indications are all toward a building up of the blood. Amongst the remedies recommended are *arsenicum*, *phosphorus*, *ferrum*, *quininæ sulphas*, and *oleum morrhuæ*. Excision of the glands in the early stage may be practiced.

ADDISON'S DISEASE.

Synonym. Melasma supra-renalis.

Definition. "The bronzed-skin disease." Thus defined by Averbeck: "A well-marked constitutional disease, exhibiting itself locally as a chronic inflammation of the supra-renal capsules, but in its essence consisting in a peculiar anæmic condition, always tending toward death, which is characterized by intense development of pigment in the cells of the rete malpighii and in the epithelium of the mucous membrane of the mouth."

Causes. Obscure. Tubercle, scrofula, and syphilis have each been given as the cause.

Pathological Anatomy. A low form of inflammation, termi-

nating in degeneration of the supra-renal capsule. The blood is deficient in fibrin and red corpuscles, with a slight increase of the white corpuscles. Fatty degeneration of the heart and vessels has been observed in some cases.

"The most striking change during life—the abnormal pigmentation—is due to the deposition of granular pigment in the cells of the rete malpighii, in the papillary portion of the cutis, and even in the connective-tissue corpuscles. No change occurs in the proper structure of the skin. Similar pigment deposits occur in the mucous membrane of the mouth, especially along the edges of the teeth."

"The disease of the supra-renal capsules excites an irritation of the vaso-motor system—the trophic system—which leads to the pigmentation."

Symptoms. The onset of the disease is insidious, with a feeling of extreme *languor*, *muscular fatigue*, *asthenia*, *indigestion*, *anorexia*, *dyspnœa*, *cardiac palpitation*, *vertigo*, *melancholia*, and excessive drowsiness.

The surface is first pale, then changes to a hue like that of *melanæmia*, changing to *icteroid*, finally resembling the color of a mulatto, and then to a *lustreless bronze*. These changes also occur on the mucous membrane of the lips, tongue, gums, and mouth.

Prognosis. An incurable disease. Duration, a year or two.

Treatment. Symptomatic.

HÆMOPHILIA.

Synonyms. Hemorrhagic diathesis; "bleeder's disease."

Definition. A congenital condition characterized by a tendency to uncontrollable hemorrhages, with or without abrasions.

Cause. Hereditary.

Symptoms. The *bleeding* appears about the period of first dentition, and consists of spontaneous *hemorrhages* from the mucous membrane of the nose, mouth, lungs, stomach, intestines, and genito-urinary passages, or in *perfect cases* hemorrhages occur directly from the fingers, toes, lobes of the ears, back of the hands or arms, without any apparent change in the skin, and continue in spite of the most powerful means, for days or weeks. *Traumatic hemorrhages* occur if an injury of any kind is sustained about the period of the development of the bleeding.

Epistaxis is the most common form of all those named.

Attacks of arthritis with fever occur with hæmophilia, resembling acute rheumatism.

As a result of the great loss of blood, the individual suffers from all the symptoms of profound anæmia.

Diagnosis. It is impossible to confound the "bleeder's disease" with any other affection.

Prognosis. Death is the usual termination within a few weeks from the time of its development, which may not be until adult life.

Treatment. Entirely symptomatic. It is claimed that "*potassii chloras*—an ounce of a saturated solution three times a day—combined with *tinctura ferri chloridi*," will eradicate the constitutional tendency.

SCORBUTUS.

Synonyms. Scurvy; scorbutic purpura.

Definition. A peculiar condition of malnutrition or anæmia, gradually developing upon a dietary deficient in fresh vegetable material; characterized by decided anæmia, debility, mental lethargy, petechiæ, and a swollen and spongy state of the gums, with a tendency to bleed upon the slightest irritation.

Causes. The disease only occurs when fresh vegetable nutriment or some appropriate substitute has been for a time partially or completely withheld. It is held that the diet alone is not sufficient to cause the disease; the mental factor of depression of spirits, or in some cases home-sickness (nostalgia), must be associated.

It is sometimes classed as an infectious disease, due to a peculiar germ, a view which is gaining ground.

Pathological Anatomy. An undetermined derangement in the composition of the blood, with diminished proportion of the potash salts. Spleen enlarged. The tissues are wasted and present extravasations, due to either one of or the combined presence of the following conditions, to wit: liquid condition of the blood, allowing it to escape from the vessels, alterations in the walls of the vessels, or a vaso-motor paralysis.

Symptoms. General weakness, lassitude, indisposition to either mental or physical exertion. The skin is dry, rough, and of a muddy pallor, the face pale and bloated. *Swelling* and *sponginess* of the

gums, with great tendency to bleed and an exceedingly *offensive breath*. *Looseness of the teeth*, *hemorrhages* from mucous surfaces, and *extravasations of blood* within and beneath the skin. The *lips are pale*, which is in striking contrast to the *redness of the gums*; the eyes are sunken and surrounded by dark blue circles.

Hemorrhages occur from the stomach, mouth, bronchial tubes, intestinal canal, and vagina. The skin is dry and rough, resembling that of a plucked fowl. Œdema of the face and ankles not infrequent.

Depression of the spirits is characteristic. Palpitation and dyspnœa on exertion. Urine high-colored, speedily becoming fetid.

The patient usually longs for *fresh vegetables* and *fruits*.

Complications. Dysentery. *Scorbutic dysentery* is a frequent complication. It may co-exist with typhoid and typhus fever.

Prognosis. Favorable, if early and properly treated.

Treatment. The chief indication is the assimilation of the alimentary principles needed for the healthy constitution of the blood and the invigoration of the system.

The juice of lemons, oranges, and other fruits; it is wonderful what improvement will follow the use of two or three lemons daily. Antiscorbutic vegetables, to wit: raw cabbage, cresses, and raw potatoes, sauer kraut, in conjunction with meats, milk, and farinaceous food.

Improve the appetite and digestion by the use of *strychninæ sulphas*, *quininæ sulphas*, *mineral acids*, and bitter *infusions*. *Potassii chloras*, locally, will relieve the oral symptoms.

PURPURA.

Synonyms. Hæmorrhœa petechialis; Morbus maculosus Werlhofii.

Definition. An acute disease, characterized by purplish discolorations of the skin, the result of hemorrhages into the upper layers of the cutis and beneath the epidermis. When the purpuric spots are tiny, like a pin-point, they are termed petechiæ; when larger in size, they are termed ecchymoses.

Varieties. *Purpura simplex; purpura hæmorrhagica; purpura urticans; peliosis rheumatica.*

Causes. Not properly understood; a special germ supposed to be the cause. It may occur at any age, but is especially frequent in

children and elderly people. Its occurrence after the ingestion of certain articles of diet has been observed.

Symptoms. *Purpura simplex* is the mildest form of the affection, and is characterized by the *sudden* appearance of *small, bright red* spots—a cutaneous hemorrhage—most commonly on the legs coming in crops, associated with slight lassitude, mild febrile reaction, and *aching pains* in the limbs. The hue of the spots rapidly fades to a purplish color and slowly disappear. Relapses are common.

Purpura hæmorrhagica has, in addition to the *eruption* of purpura simplex,—the cutaneous hemorrhage,—a flow of blood from the free surface of mucous membranes. The most common hemorrhage is *epistaxis*, slight or profuse. Other hemorrhages are *hæmatemesis, melæna, hæmaturia, hæmoptysis, menorrhagia*, and also into the substance of the mucous membranes of the palate, cheek, and gums. This variety is associated with great debility and depression, moderate fever, and disorders of digestion. Marked *anæmia* results from the hemorrhages.

Purpura urticans is a combination of *urticaria* and *purpura simplex*. It is characterized by rounded and reddish elevations of the cuticle, resembling wheals, but which are not accompanied, like the wheals of urticaria, by any sensation of itching or tingling. They are usually situated on the legs, thighs, breast, and arms, and are interspersed with petechiæ. They gradually form and subside within twenty-four or thirty-six hours. Relapses are frequent.

This variety is also associated with malaise, moderate fever, and pains in the limbs.

Peliosis rheumatica (Schönlein's disease) is characterized by *multiple arthritis* and a *purpuric* eruption; frequently the arthritic symptoms are associated with *urticaria* or with *erythema exudativum*. Œdema is often marked, as in the fever, sore-throat, and general constitutional symptoms. The eruption is sometimes of vesicles—*pemphigoid purpura*.

Diagnosis. The purpuric eruption in each variety of the affection is so characteristic that an error seems impossible.

Prognosis. Purpura simplex and purpura urticans are favorable, but relapses are very frequent. Purpura hæmorrhagica is always a grave disease, often proving fatal from exhaustion, or, more rarely, from cerebral or pulmonary hemorrhage. Peliosis rheumatica is often a severe affection, but recovery is the rule.

Treatment. Rest and a concentrated nutritious diet, and the moderate use of stimulants and tonics. *Arsenicum* in large doses is often valuable, using *liquor potassii arsenitis*, to combat the resulting anæmia.

The internal use of *oleum terebinthinæ* is one of the most reliable remedies for many forms of the disease, but not when hemorrhages occur from the stomach or kidneys. The following is an eligible formula:

℞.	Ol. terebinthinæ, ...	f℥ij	8. Cc.
	Ol. amygdalæ express., ...	f℥j	30. Cc.
	Tinct. opii deodorat., ...	f℥ss	2. Cc.
	Mucil. acaciæ, ...	f℥j	30. Cc.
	Aq. lauro-cerasi, ... ad	f℥iij	ad 90. Cc. M.

Sig.—One tablespoonful every three or four hours, diluted.

Among the other numerous remedies suggested, the most reliable have been *acidum sulphuricum dilutum* and *tinctura ferri chloridi*. Good results have followed *acidum carbolicum*, ♏ ij–iij (0.13–0.2 Cc.) every three hours, in cases seen by the author, and a particularly persistent case was cured by full doses of *potassii iodidum*. Dr. Da Costa, for hemorrhages, strongly recommends extractum ergotæ fluidum, f℥ss–f℥j (2–4 Cc.) every two hours; or acidum sulphuricum dilutum, ♏x–xx (0.6–1.3 Cc.) every few hours.

"If hemorrhages that are threatened come on, with a strong pulse, flushed face, headache, and excitement, *digitalis*, *quinina*, and *ergota* are the appropriate medicaments." (Bartholow.)

Argenti nitras, gr. $\frac{1}{12}$–¼ (0.005–0.016 Gm.), three or four times daily, is of value in purpura hæmorrhagica. Argentum is said to have a specific influence on the capillary circulation by its impression on the vaso-motor nerves.

Locally, to arrest bleeding, astringents and either hot or cold water or ice.

ACUTE GENERAL DISEASES.

PAROTIDITIS.

Synonyms.—Parotitis; mumps.

Definition. An acute, specific, *infectious* inflammation of one or both parotid and other salivary glands and the surrounding connective tissue, with a very strong tendency to migrate into the mammæ or testes; characterized by pain, swelling, and disordered function of the glands.

Causes. A specific poison. Contagious. Occurs in epidemics, although isolated cases are seen. Males more liable than females. The most common ages between five years and puberty. As a rule, it occurs but once in the same individual.

The *period of incubation* is from two to three weeks.

Pathological Anatomy. There is inflammation of one or both parotid glands, and in severe epidemics the cellular tissue pervading the gland is involved.

The catarrhal inflammation begins in the gland ducts and rapidly extends to the gland proper. There is congestion, swelling, and an infiltration of serous fluid, with more or less infiltration of the adjacent tissues. The swelling may suddenly reach an enormous size and as suddenly decline, the gland returning to its normal condition, or, rarely, an abscess results, with partial or complete destruction of the gland. Occasionally the submaxillary gland is involved, also the mammæ and testes.

Metastatic parotiditis occurs secondary to severe blood-poisoning, as in pyæmia, typhoid or typhus fevers, or diphtheria. The usual termination of secondary parotiditis is by suppuration and destruction of gland structure.

Symptoms. The onset is rather sudden, by *malaise*, *chill*, *fever*, 101°–103° F., *quick pulse*, *headache*, *dry skin*, *scanty urine*, followed within a day or two by *stiffness* at the angles of the jaw, *swelling* of the *parotid* and other salivary glands, *pain* increased by moving the jaws, with *general œdema* of the affected side of the face, at times the

skin being *reddened*. *Salivation* is frequent, and occasionally deafness occurs.

The swelling and other glandular symptoms subside about the sixth or seventh day, to be followed by restoration to health, or, what is more common, the involvement of the *opposite gland*.

At any time during the disease *metastasis* to the *mammæ*, *ovaries*, or *testes* is apt to occur, when the symptoms peculiar to such affections will be added. It has been noted that a *continuance* of the *temperature* after the decline of the parotid symptoms has begun usually is significant of *metastasis*. It is claimed that the involvement of other organs during the course of mumps is not an example of metastasis, but is a true transfer of the disease.

Diagnosis. An error seems impossible.

Prognosis. Simple mumps, favorable; the chief danger being from the altered function of the mammæ, ovary, or testes after *metastasis*.

Treatment. The disease being self-limited, the indications are entirely symptomatic, with attention to the secretions, although *extractum pilocarpi fluidum*, ♏x–xxx (0.6–2 Cc.), repeated, has been used with varying success as a specific.

Locally, either cold or warmth to the affected gland, whichever is most agreeable, or equal parts of *unguentum belladonnæ et hydrargyri*.

If the swelling shows a tendency to linger, use small blisters over the part and administer *potassii iodidum*; if suppuration occur, evacuate pus, apply poultices, and administer *quininæ sulphas*.

If orchitis occur, the use of the *belladonna* and *mercurial ointment* or the *ice bag* to the inflamed testicle, and the internal use of *tinctura pulsatillæ*, ♏iij–v (0.2–0.3 Cc.) every hour or two, or *potassii iodidum*.

DIPHTHERIA.

Synonyms. Putrid sore throat; malignant ulcerous sore throat; malignant quinsy; membranous angina.

Definition. An acute, specific, constitutional disease; both *epidemic* and *contagious*, beginning by an affection of the throat, characterized by a local exudation and glandular enlargements; attended with fever, great prostration of the vital powers, and albuminuria, and often having for its sequelæ various paralyses.

Causes. A *specific germ*, the Klebs-Loeffler bacillus. The bacillus in its growth produces a potent toxic substance,—a toxalbumin,—the absorption of which produces the disease, and not the organism itself. The diphtheria bacillus is associated with other pathogenic bacteria, the most active of which is the *streptococcus pyogenes*. It is pre-eminently a disease of childhood. It is apt to recur in those who have once been affected. All conditions of bad hygiene increase its virulence and diffusion, although the chief cause of its spread is *contagion*. Nasal, pharyngeal, and laryngeal catarrh are the kind of soil promoting the growth of the bacillus and its toxin.

The poison exists in the exudation and secretions of the fauces and saliva, and floats in the atmosphere at a considerable distance from the patient. The virus adheres to the clothing, the bedding, the furniture, and the room which the patient occupied.

The *period of incubation* is from three to five days.

Pathological Anatomy. The *diphtheritic* inflammation differs from either the *croupous* or *catarrhal* form, in that the exudation is not only *upon*, but also *within*, the substance of the mucous membrane.

At first there is *redness*, which may begin in any part of the throat, associated with *swelling* and an *increased secretion* of viscus mucus. The redness spreads over the entire mucous surface, when the *exudation* makes its appearance, at first giving the affected mucous membrane a glazed appearance, which is very characteristic. The deposit may commence from one or several points, such as one tonsil, the soft palate, or the back of the fauces, which, however, speedily extend and coalesce, forming extensive patches, or cover uniformly the entire surface.

The patches are of variable thickness, which is increased by successive layers being formed underneath.

The *color* is usually gray, white, or slightly yellow, but may be brownish or blackish, the *consistence* ranging from "cream to wash leather."

On removing the membrane, which is accomplished with more or less difficulty, a raw bleeding surface is exposed, and at times an ulcer, which is speedily covered with a fresh deposit.

If the exudation separate itself, it is either not renewed at all or only in thinner films.

The exudation or membrane, examined by the microscope, is

composed of fibrin, pus corpuscles, epithelial granular cells, and the Klebs-Loeffler bacillus and other pathogenic bacteria.

If the *larynx*, *trachea*, or *nasal* mucous membranes participate in the disease, the *croupous* and not the *diphtheritic* form of inflammation occurs.

The *lymphatic glands* of the neck, whose vessels originate in the faucial tissues, are enlarged and inflamed, and contain large numbers of *bacteria*, probably originating as the result of decomposition.

The muscular tissue of the *heart* becomes soft, is easily torn, and its fibrillæ are far advanced in granular degeneration. Ulcerative endocarditis has been frequently observed. The *kidneys* undergo a granular degeneration in severe attacks. The *blood* undergoes alteration, being black and fluid.

Symptoms. Following the law of *contagious* diseases, the symptoms vary in intensity in different cases, the prominent symptoms being often disproportionate to the gravity of the attack.

The *invasion* may be *mild*, with *rigors* succeeded by moderate *fever*, *headache*, *languor*, *loss of appetite*, *stiffness of the neck*, *tenderness* about the *angles of the jaw*, or *slight soreness of the throat*.

In other cases the *invasion* is more *abrupt* and *severe*, with *chilliness* followed by great *febrile* reaction, 103° to 105° F., *pain in the ear*, *aching of the limbs*, *loss of strength*, *painful deglutition*, and *swelling of the neck*, compelling the patient to take to bed from the onset.

The *appetite* is poor, the *tongue* slightly coated, sometimes more or less exudation appearing upon it, the *bowels* either regular or slightly relaxed. The *pulse*, at first full and strong, soon becomes either rapid or slow, but *compressible*. The *urine* is scanty, high-colored, and contains *albumin*.

The *local* symptoms in the majority of cases are associated with the throat. The patient often complains of a frequent and persistent desire to hawk, in order to clear the throat. On *inspection*, the fauces are seen *red* and *swollen* and more or less covered with a film of diphtheritic *exudation*, giving a glazed appearance, soon followed by the dirty-white membrane; sometimes the *tonsils* and *uvula* are greatly *swollen* and spotted with exudation. In severe cases, more or less *ulceration* or *sloughing* may be observed. Not infrequently fragments of exudation, the *false membrane*, are expectorated, with particles of the ulcerated tissues, having an *offensive odor*, which is transmitted to the breath. The *lymphatic glands* of the neck are

enlarged and *tender*, and in severe cases the tissues of the neck are greatly tumefied.

Extension to the *nasal cavities* causes a *sanious* and *offensive* discharge from the nose, with attacks of *epistaxis*.

Extension to the *larynx* is indicated by *hoarseness* or *complete loss of voice*, *croupy cough*, and obstructive *dyspnœa*, which often becomes urgent, the breathing being *noisy and stridulous*, and subject to paroxysmal exacerbations. If the inflammation extend to the *bronchi*, the breathing becomes still more embarrassed.

Duration. Ranges from two to fourteen days, an average being about nine days, although complications and sequelæ may prolong its course.

Relapses are not uncommon.

Sequelæ. Those who recover from a severe attack remain often for weeks with a *pale* and *cachectic* appearance, due to the profound blood alteration.

Paralysis is a common sequela, following the mild as often as the severe attacks. Usually not occurring until the patient seems fully convalescent.

Pharyngeal paralysis is most common, causing difficulty or inability of *deglutition*, fluids regurgitating through the nose.

Cardiac paralysis, bradycardia, is not infrequent, the pulsations descending to 60, 50, 40, and, in a case seen by the author, to 20 per minute. Heart failure and fatal syncope may occur at any time during the disease.

Diphtheritic paralysis may affect the motor muscles of the eye, causing *strabismus;* the muscles of one side, *hemiplegia;* of the legs, *paraplegia;* and of the bladder, leading to *retention of urine* or difficulty in voiding it.

Multiple neuritis, with the attending loss of power, is a rare sequela.

Sensation and the reflexes are *diminished* in the paralyzed parts.

Diagnosis. The diagnosis is now made certain by making a culture from the deposit, and if the bacillus is present, the characteristic colonies can be seen in the course of twenty-four hours, under the microscope.

From *follicular ulceration of the tonsils*, which is frequently termed diphtheria, by the slight or absent systemic symptoms, the ulcerated condition being limited to the tonsils, but often one, and the absence of glandular enlargement, and following palsies.

From *pharyngitis*, by the absence of exudation and loss of faucial tissue and constitutional symptoms.

From *scarlatina*, by the presence of the eruption and the absence of membrane in the fauces. The association of scarlatina and diphtheria must not be forgotten.

From *membranous croup*, by the difference in the constitutional symptoms; croup appears sporadically and is not contagious, diphtheria being highly contagious and frequently occurs in epidemics; in diphtheria of the larynx the depression is clearly that of blood-poisoning, while in croup the depression is in proportion to the mechanical obstruction of the respiration by the membranous exudation. The pathology of croup is simple and easy of investigation; diphtheria is obscure in its etiology and progress. The temperature record of croup is a high one until carbonic acid poisoning is imminent from the mechanical obstruction to respiration, while in diphtheria the tendency to a decline in the temperature after the fourth day is nearly characteristic, regardless of the amount of laryngeal obstruction. In croup the pharynx contains no membrane, and is but slightly, if at all, inflamed, and associated trouble in the nose is of the rarest occurrence, the very reverse obtaining in diphtheria. In croup the laryngeal symptoms are from the onset, while in laryngeal diphtheria the pharyngeal symptoms almost always precede. In croup glandular involvement is a clinical novelty, as are subsequent palsies, while glandular involvement and various palsies are the rule in diphtheria. Albuminuria is the rule in diphtheria, seldom occurring in croup.

Prognosis. Always grave, but more so in children than in adults. Its gravity, in the majority of cases, is proportionate to the local symptoms. The average mortality is about *ten per cent.*

Favorable indications are, moderate fever, strength slightly impaired, a good constitution, and moderate exudation.

Unfavorable indications are, high fever, great depression, spreading exudation, great swelling of the cervical glands, large amounts of albumin, extension to larynx and nasal mucous membranes, hemorrhages from the fauces and nose, and an epidemic character.

Treatment. The introduction of the *antitoxin serum* has changed the prognosis of this formidable malady. The injections are made where the skin is loose and at points that will not interfere with the comfort of the patient. The dose must be estimated in *antitoxic*

units, and not by the unit of the serum. The dose is from 1000 to 3000 units, according to the severity of the attack. If the dose is sufficient, evidences of improvement are seen within a few hours. With the serum-therapy must be associated the constitutional treatment, as it is a disease of great debility, and the blood being more or less altered, it follows that *sustaining* measures should be resorted to in *all cases*.

The *diet* should be of the most nutritious character, from the onset, using such articles as milk, eggs, broths, and oysters, at *intervals* of every *two or three hours*. If deglutition be too painful, resort must be had to nutritious *enemata*, the following being a suitable formula:

℞. Milk, ... f℥j 30. Cc.
Spts. frumenti, ... f℥iv 15. Cc.
Egg, ... One M.
Sig.—Little salt added, beaten up and warmed.

Stimulants should be used boldly from the onset, guiding the dose by the effect; usually a child of two years requires from *thirty* to *sixty minims* (2–4 Cc.) of *spiritus vini gallici* or *spiritus frumenti* every two or three hours; an adult from *two* to *four drachms* (8–15 Cc.) every three hours. It is a mistake to wait for signs of debility before using alcohol in diphtheria. *Strychninæ sulphas*, in frequent doses, should be used from the onset.

Of drugs, two are warmly advocated; *ferrum* and *hydrargyrum*. Of the great value of *tinctura ferri chloridi* there is no question, but for *hydrargyri chloridum corrosivum* it has hardly realized the expectations of the profession, except in laryngeal cases. A combination of *ferrum* and *potassii chloras*, in *full doses*, frequently repeated, has seemed, when begun early in the attack, to modify the course of the malady, and they have the additional advantage of acting locally upon the throat as they are swallowed. A good formula is—

℞. Tinct. ferri chlor., ... ♏v–x .3–.6 Cc.
Potassii chlor., ... gr. iij–v .2–.3 Gm.
Glycerini, ... f℥ss 2. Cc.
Syr. zingib., ... ad f℥j–ij ad 4.–8. Cc. M.
Sig.—In water every three hours, for a child of two or three years.

Ferrum and *hydrargyri chloridum corrosivum*, repeated every second or third hour, may be combined as follows:

℞. Hydrargyri chloridi corrosiv., .	gr. $\frac{1}{4\,8}$	.0015	Gm.	
Tinct. ferri chloridi, ...	♏v–x	.3–.6	Cc.	
Glycerini, ...	♏x	.6	Cc.	
Aquæ, ...	f℥j	4.	Cc.	M.

Sig.—Every hour or two, well diluted.

The efficacy of the above is greatly enhanced by the addition to each dose of *tinctura belladonnæ*, ♏ j–v (0.06–0.3 Cc.).

Quininæ sulphas, gr. xvj–xxiv (1–1.56 Gm.) per day for a young adult, and gr. v–x (0.3–0.6 Gm.) for a child, should be used throughout the disease; if irritability of the stomach prevent its administration by the mouth, it can be used as a *suppository*, or locally in the form of the *oleate*.

Sustain the heart with either *digitalis*, *glonoin*, *caffeinæ citratæ*, or *strychninæ sulphas*, or a combination of these drugs.

Calomel in small doses, combined with *sodii bicarbonas* every hour until it is beneficial, and especially in cases showing a tendency to spread toward the larynx. Indeed, a *tolerance* to calomel seems to exist in *diphtheria of the larynx*.

Watch the urine carefully throughout the disease; diminution in the amount with much albumin is of bad omen. The bowels must be regular.

Isolation of the patient and *disinfection* of the clothing and utensils is of importance. All clothing should be soaked twenty-four hours and boiled in a two per cent. solution of carbolic acid.

Inhalations of steam and hot water, and allowing the patient to suck pellets of ice, give relief. Sponges dipped in hot water and applied to the angles of the jaw are beneficial.

The chief danger of communication of the poison is the air exhaled from the fauces and from the surface. Dr. J. Lewis Smith recommends the following plan to counteract the danger. Add four ounces of the following solution to one quart of water and allow them to simmer constantly, near the patient, in a broad surfaced tin or zinc wash-basin: ℞. Olei eucalypt., acidi carbolici, āā f℥j (30 Cc.); spirit. terebinthinæ, f℥ viij (240 Cc.). M. The vapor is strong, penetrating, and prophylactic, but not unpleasant. In hot weather, or when a fire is not convenient, saturate cloths a foot square with the same solution and place them on paper on the bed of the patient.

Locally. Two indications to be met, one to prevent or limit the local development of the bacilli, and the other to combat the effects

of the toxic material which the bacilli produce. The first question asked is, Can we dissolve the membrane? "In laboratory, yes; in throat, no." (Da Costa.)

Cleanliness of the fauces is of the utmost importance, and if a *non-irritating disinfectant* be added, its value is enhanced. Prof. Bartholow "has seen excellent results from the frequent application of a solution of *acidum lacticum*, strong enough to taste sour, by means of a mop." Excellent results are obtained from spraying the throat with a fifty per cent. solution of *hydrogen peroxide*. Swabbing the throat with the following is valuable:

℞. Acidi carbolici, ...	♏xx	1.3	Cc.
Tinct. ferri chlor., ...	f℥iv	15.	Cc.
Glycerini, ...	f℥j	30.	Cc.
Aq. destil., ...	f℥j	30.	Cc. M.

SIG.—Locally, every three hours.

Applications of corrosive sublimate to the throat are often valuable. Dr. Ernest Laplace has demonstrated that corrosive sublimate in solution, slightly acidulated with tartaric acid, has its germicide property increased, as in the following 1–500 solution (℞. Hydrargyri chlor. corrosiv., gr. 3.85; acid tartaric, gr. 19.25. M.)

The following, used as a *gargle*, or applied by a mop, is useful:

℞. Potass. chlorat., ...	℥iv	15.	Gm.
Acid. carbol., ...	gr. ij–iv	.13–.26	Gm.
Tinct. myrrh., ...	f℥j	30.	Cc.
Inf. cinchonæ, ...	f℥ij	60.	Cc. M.

It is a mistake to struggle with children over their refusal to use a gargle or allow the use of the spray, as they do not know how to gargle and they are afraid of the spray. Much better to add plenty of glycerin to their medicine, and use no liquid for some time after swallowing.

For *laryngeal diphtheria* the same general treatment, especially the *mercurial*, with *inhalations* of lime by slaking freshly-burned lime in a vessel and directing the vapor to the child by a newspaper, or some similar contrivance, or using three parts of *liquor calcis* and one part of *glycerinum* in an *atomizer*, every half hour or hour, or *liquor trypsin*, as a spray. If these means fail, resort must be had to *tracheotomy*, or *intubation of the larynx*, which have succeeded in many

desperate cases. It is safer to insert a tube at the onset in all cases of laryngeal diphtheria.

For *nasal diphtheria*, the same general treatment, and syringing the nose every two or three hours with a weak solution of *potassii chloras*, or *acidum carbolicum*, or *hydrogen peroxide*, or the following:

℞.	Sodii sulphit., ...	ʒ iij	12. Gm.
	Glycerini, ...	f ʒ ij	8. Cc.
	Aquæ, ...	f ʒ iv	120. Cc.

For *the paralysis*, *strychninæ sulphas* and *ferrum* internally, or *strychninæ sulphas* hypodermically, with the *galvanic* or *faradic current* locally.

GLANDERS.

Synonyms. Farcy; malleus humidus.

Definition. An infectious disease of the horse, communicable to man and some domestic animals, but not to cattle; characterized by nodular growths in the nose—glanders, and under the skin—farcy.

Cause. Due to a specific bacillus—*bacillus Mallei*. The organism resembles the tubercle-bacillus, though somewhat shorter and thicker. Communicated by the discharge from an infected animal to an abraded skin or mucous surface. Contagious. *Incubation* from three to five days.

Pathological Anatomy. Nodules, consisting of aggregations of round cells of lymphoid or polymorphonuclear type, which have a strong tendency to suppurative or necrotic softening. The floor and edges of the ulcers (softened nodules) are irregular and yellowish, discharging more or less purulent matter. The nodules develop particularly in the nares and the skin, and, rarely in the lungs. The lymphatic glands of the neck and elsewhere enlarge and may suppurate.

Symptoms. There is an *acute* and a chronic form of glanders.

Acute glanders. *Redness* and *swelling* of the nasal mucous membrane with *burning* and *dryness*, followed by the development of the *nodules*, which rapidly break down and discharge a fetid hemorrhagic or muco-pus. There is *headache*, painful deglutition, cough, *fever*, *prostration*, rapidly developing typhoid symptoms, and death.

Acute farcy or glanders of the skin is a *nodular swelling* with subsequent ulcers and discharge of a fetid hemorrhagic pus on the skin. Papules, becoming pustules, followed by ulceration, occur in the neighborhood of the nodules. The lymphatic glands and vessels are involved, but not the nose. Prostration and typhoid symptoms rapidly develop.

In the *chronic* variety the development, course, and symptoms are all more backward and of less severity.

Diagnosis. The certainty of diagnosis is made possible by making cultures.

Prognosis. Acute variety fatal. Chronic variety, if early diagnosed, many may recover.

Treatment. Palliative and surgical means for the lesions. It is possible the *serum-therapy* may soon be able to control, cure, or modify this fatal disease.

ACUTE ARTICULAR RHEUMATISM.

Synonyms. Rheumatic fever; inflammatory rheumatism.

Definition. A constitutional disease, characterized by fever, inflammation in and around the joints, occurring in succession, and a great tendency to inflammation of either the endocardium or pericardium.

Causes. The *predisposing* causes are inherited tendency, scarlatina, and the puerperal state.

The *exciting* causes are exposure to cold and chilling of the body in those predisposed. Rheumatism rarely occurs before seven or after fifty years. The liability to the disease is increased by having had an attack. It is claimed that a specific bacteria has been found in the swollen joints, which may prove to be the etiological factor in the production of the painful affection.

Pathological Anatomy. The *blood* contains an excess of *lactic acid*. The *joints* bear the brunt of the attack; the synovial membrane is reddened, the vascularity of the synovial fringes is increased; so with the synovial fluid, which is thinner, of a reddish color, containing some gelatinous coagula of fibrin, and, under the microscope, nucleated cells, ordinary pus cells being rarely seen.

The swelling visible from the affected part depends mostly on inflammatory œdema of the connective tissue around the joint.

The *pain* is probably due, in all cases, to stretching of and pressure on the elements of the tissues by the dilated capillaries and the inflammatory œdema. For the changes which ensue when the endo- and pericardium are attacked, the reader is referred to the sections on those diseases.

Symptoms. Begins suddenly, generally at night, with a *chill* or chilliness, *pain* and *stiffness in the joints*, loss of appetite, at times nausea and vomiting, followed by *fever*, the temperature soon reaching 102° to 104° F., in rare cases 108° to 110° (*the hyperpyrexia*), the *pulse* seldom exceeding 95, *great thirst*, *profuse acid sweats*, scanty, *high-colored*, *acid urine*, at times showing traces of albumin; the *bowels constipated*. The *fever* continues throughout the attack, showing marked remissions. Delirium is absent, except the *hyperpyrexia* occur. *Sleep* is prevented by the *pain* and the profuse *perspirations*. The strength is moderately well preserved.

The *skin* is often covered with an eruption of *miliaria rubra*, *red papules*, and *miliaria alba*, the result of irritation at the orifices of the sweat glands, from the excessive perspiration.

The *local* phenomena are *pain*, *tenderness*, *increased heat*, *swelling*, and *redness* of one or more joints; if but one joint, it is termed *monoarthritis;* if more than one, *polyarthritis*. *Pain* is aggravated by *motion* and *pressure*. *Swelling* is most apparent in those joints not covered with muscle, as the knee, wrist, elbow, ankle, and the hands and feet, and is proportionate to the acuteness of the attack. The inflammation may abruptly cease at one or more joints, and as suddenly attack others.

The disease is extremely irregular as regards the number of joints affected, although the local manifestations are controlled by an important pathological law, *the law of parallelism*. Corresponding joints are often affected together, and when not, the different affected joints are either on one side of the body, or those on both sides which are analogous, as the knee, elbow, wrist, ankle, hip, and shoulder, are attacked together.

Complications. Pericarditis, endocarditis, myocarditis, cerebral endarteritis, bronchitis, pneumonitis, and pleuritis.

Duration. The duration of acute rheumatism is governed entirely by the presence or absence of complications. Uncomplicated cases recover in from *thirteen* to *twenty-one* days, although they may be prolonged to five or six weeks. Relapses are frequent.

Diagnosis. A typical case cannot be mistaken for any other disease, but cases running a *subacute* course may be mistaken for acute rheumatoid arthritis, gonorrhœal rheumatism, or pyæmia.

Acute rheumatoid arthritis attacks one joint at a time and becomes permanent, has slight, if any fever, no sweats or cardiac lesions.

Gonorrhœal rheumatism is associated with a gleety discharge, or follows the sudden cessation of an acute or subacute gonorrhœal discharge, attacks either the ankle or wrist only, is slowly influenced by treatment, and lacks the febrile phenomena.

Pyæmia is usually manifested at a single joint at the time, and is followed by suppuration and all the symptoms of hectic fever.

Prognosis. Recovery is the rule in uncomplicated cases, the mortality being about three per cent. When death occurs, it usually depends upon hyperpyrexia, cardiac complication, or cerebral endarteritis.

Treatment. Owing to our imperfect knowledge of the exact nature of this most painful disease, its treatment still remains either empirical or is directed toward certain prominent symptoms or complications. Garrod claims that "colored water" is about as potent as anything else, for it is, he says, a "self-limited disease," sometimes running a long and sometimes a short course.

Rest in bed, whether the pain forces it or not, is important. *Warmth* is as imperative, for which purpose the patient should be kept in *blankets*—no sheets—and wear woolen garments. The *diet* should be easily digested food, milk being the most suitable.

Strong and vigorous patients do well with *acidum salicylicum* or the *salicylates* in large and frequently repeated doses.

℞.	Acidi salicylici, ... ℥ss	15. Gm.	
	Liq. ammonii acetat., ... f℥iv	120. Cc.	
	Spts. ætheris nitrosi, ... f℥j	30. Cc.	
	Syr. simplicis, ... f℥j	30. Cc.	M.

Sig.—Tablespoonful every three hours, well diluted.

Or—

℞.	Sodii salicylat., ... ℥j	30. Gm.	
	Tinct. cinchonæ comp., ... f℥iij	90. Cc.	
	Aq. menth. pip., ... f℥iij	90. Cc.	M.

Sig.—Dessertspoonful every three or four hours till relief, when widen the interval.

Or—

℞. Potassii acetat., ... ℥j 30. Gm.
Acid. salicylici, ... ℥ss 15. Gm.
Syr. limonis, ... f℥ij 60. Cc.
Aq. menth. pip., ... f℥viij 240. Cc. M.
Sig.—Tablespoonful every three hours, diluted.

If benefit follows, the evidence is quickly afforded in the relief of pain and the decline of the temperature and swelling. If, therefore, after three or four days' use of the salicylates or acidum salicylicum, as above recommended, signs of improvement are wanting, the treatment had better be changed for the *alkaline* treatment, which consists in the administration of *an ounce and a half* of the alkaline carbonates, either alone or with a vegetable acid, each twenty-four hours, until the *urine becomes neutral or alkaline*, when the quantity is reduced to an amount sufficient to maintain alkaline urine.

The following are good formulæ for the alkaline treatment:

℞. Potassii bicarbonatis, ... ℥ij 8. Gm.
Acid. tartarici, ... gr. xxx 2. Gm.
Dissolve in a glass of water and drink effervescing every three hours.

Or—

℞. Potass. bicarb., ... ℥ij 8. Gm.
Succi limonis, ... f℥iv 15. Cc.
Aquæ chloroformi, ... f℥ss 15. Cc. M.
Sig.—In water, every three hours.

After the more acute symptoms are relieved change whichever plan of medication has been used for *tinctura ferri chloridi*, ♏xx (1.3 Cc.), every three or four hours, well diluted, or for full doses of Basham's mixture.

Pale, feeble, and anæmic patients, or attacks following scarlatina are most favorably influenced by—

℞. Strychninæ sulph., ... gr. $\frac{1}{60}$ .001 Gm.
Tinct. ferri chlor., ... ♏xv–xxx 1.–2. Cc.
Liquor. ammonii acetat., ... f℥ss 15. Cc. M.
Sig.—Every four hours, in a glass of water.

Dr. S. Solis-Cohen has reported good results from the following combination in anæmic and run down cases, to which he has given the name of "mistura ferro-salicylata":

℞. Sodii salicylatis, ... ℥iv 15. Gm.
Glycerini, ... f℥j 30. Cc.
Acidi citrici, ... gr. x .6 Gm.
Ol. gaultheriæ, ... f℥ss 2. Cc.
Mucil. acaciæ, ... f℥ss 15. Cc.
Misce et adde while stirring,
Tinct. ferri chlorid., ... f℥iv 15. Cc. M.
Liq. ammonii citrat. (B. P.), ad f℥iv ad 120. Cc.

Sig.—One to two teaspoonfuls every two, three, or four hours, diluted.

Prof. Da Costa reports a lessened proportion of *cardiac complications* with *ammonii bromidum*, gr. xv–xx (1–1.3 Gm.), every four hours. I much prefer *ammonii salicylas*, gr. x–xv (0.6–1 Gm.), in simple syrup, well diluted, every four to six hours.

Subacute attacks and lingering cases are favorably influenced by *cinchonidinæ salicylas*, gr. v (0.3 Gm.), every four hours, or—

℞. Lithii salicylatis, ... gr. xv–xx 1.–1.3 Gm.
Syr. zingiberis, ... f℥j 4. Cc.
Aq. lauro-cerasi, ... f℥j 4. Cc. M.
Every four hours.

Or—

℞. Potassii iodidi, ... ℈iv 5.3 Gm.
Sodii salicylatis, ... ℥iv 15. Gm.
Elix. cinchonæ, ... f℥iss 45. Cc.
Infus. gentianæ, ... f℥iss 45. Cc.
Aquæ destil., ... f℥j 30. Cc. M.

Sig.—Dessertspoonful every three or four hours, diluted.

Good results are reported from the use of *salol*, gr. v–x (0.3–0.6 Gm.), every four hours, from *ammonii hydrochloras*, gr. xv–xx (1–1.3 Gm.), every four hours, and from *salipyrin* in solution, every four hours;

℞. Salipyrin, ... ℥iij 12. Gm.
Glycerini, ... f℥iij 12. Cc.
Syr. aurantii, ... f℥vj 24. Cc.
Aquæ destil., ... ad f℥vj ad 180. Cc. M.

Sig.—Tablespoonful, well diluted.

Whichever plan, acidum salicylicum, salicylates, alkaline, or ferrum, is adopted, *quininæ sulphas*, gr. xv (1 Gm.), per day, should also be used.

Pain and *restlessness* should be controlled by *opium* in some form, in full doses, or *atropinæ sulphas*, gr. $\frac{1}{80}$ (0.0008 Gm.), hypodermically.

For the *hyperpyrexia*, *quininæ sulphas*, gr. xxx–lx (2–4 Gm.), repeated p. r. n., with the *cold bath* or *wet pack*.

Locally, the affected joints should be wrapped in cotton-wool or flannel, saturated with a solution of *tinctura opii*, one part, and *liq. plumb. subacetat. dil.*, two parts, or *olei gaultheriæ*, f℥j (4 Cc.), with lin. saponis comp., f℥iij (90 Cc.), or—

℞. Sodii bicarbonatis, ...	℥ij	60. Gm.	
Tinct. opii, ...	f℥ss	15. Cc.	
Aquæ bul., ...	Oij	960. Cc.	M.

Dr. Bartholow finds the application of *blisters* an effective method. He says: "I have small blisters, the size of a silver dollar, placed around the joint, leaving an interval between for succeeding applications. It is by no means so painful and disagreeable as it appears at first sight. The blisters remarkably relieve the pain, bring about a more alkaline condition of the blood, and render the urine less acid, or bring it to neutral, or even to alkaline."

If the disease shows a tendency to linger in one or more joints, such joints should be immediately placed in the *hot-air apparatus*.

MUSCULAR RHEUMATISM.

Synonyms. According to location: cephalodynia; lumbago; torticollis; pleurodynia.

Definition. An affection of the voluntary muscles, inflammatory in character, either *acute* or *chronic*; characterized by pain, tenderness, and stiffness of the affected muscles. It is never complicated with cardiac disease.

Causes. A disease of adult life. One attack predisposes to another. Almost always due to cold or damp, or direct draught of cold air. Gout increases the tendency to attacks.

Pathological Anatomy. The true nature of muscular rheumatism is not yet determined. Virchow suggests a "hyperæmia of, and scanty serous exudation between, the muscular striæ, and in chronic cases inflammatory proliferation of the connective tissue."

Symptoms. The *first* attack is generally *acute*. Onset rather sudden, with *pain* in the affected muscles, with slight *tenderness*, and considerable *stiffness* and *difficulty of movement*, by which also the pain is increased.

The suffering may be severe and constant, or only on motion. *Spasm* of the affected muscles may occur. *Objective* symptoms are wanting, except it is evident that the patient keeps the affected muscles as quiet as possible. Fever is absent. The pain may prevent sleep.

Duration, *acute* form, about one week. *Chronic* variety returns frequently, and finally becomes constant and aggravated when the weather is damp.

Varieties. It may affect any or all of the voluntary muscles, but its most frequent and important varieties are:

1. *Cephalodynia.* Situated in the occipito-frontal muscles. Distinguished from *neuralgia* of the trifacial, or occipital nerve, by pain on both sides of the head, excited or aggravated by the movements of the muscle and by absence of disseminated points of tenderness.

The muscles of the eye may be affected, and movements of that organ excite pain. If the temporal and masseter muscles are attacked, mastication excites pain.

2. *Torticollis.* Wry neck, or stiff neck. Situated in the sterno-mastoid muscles. Generally limited to one side of the neck, toward which side the head is twisted, great pain being excited on attempting to turn to the opposite side. Rheumatism of the muscles of the back of the neck, *cervicodynia*, may be mistaken for occipital neuralgia.

3. *Pleurodynia.* Situated in the thoracic muscles, and may be mistaken for pleuritis, or intercostal neuralgia, from which it is differentiated by the absence of the diagnostic features of each. Pain is excited by forced breathing, coughing, and sneezing.

4. *Lumbodynia* or *lumbago.* Situated in the mass of muscles and fasciæ, which occupy the lumbar region. Most common variety. Usually affects both sides. It may set in rapidly, and become very severe. Motion of any kind aggravates the pain, often becoming very sharp or stabbing in character. It is sometimes complicated with *acute sciatica*, when the suffering is agonizing.

Diagnosis. The different varieties may be mistaken for any of the following ailments, to wit: trifacial, occipital, or intercostal neuralgia, pains of progressive muscular atrophy, neuritis, syphilis, metallic poisons, or painful affections of the loins, arising from calculi or gravel in the kidney.

A careful examination of the history is usually sufficient to arrive at a correct diagnosis.

Prognosis. Difficult to eradicate, and in chronic cases to ameliorate, but is not dangerous to life. Death never results.

Treatment. *Rest* is the first indication. This is accomplished in *pleurodynia* by firmly strapping the affected side with broad strips of plaster, extending from mid-spine to mid-sternum.

The *local* application to the affected muscles of *hot* poultices, made of two-thirds *pilocarpus* leaves and one-third *flaxseed* meal, changing them every two hours, is the most rapidly successful treatment in acute cases.

Internally, *antipyrin*, gr. x–xx (0.6–1.3 Gm.), repeated in several hours, or *ammonii hydrochloras*, gr. xv–xx (1–1.3 Gm.), every three hours, or *sodii salicylas*, gr. xv–xx (1–1.3 Gm.), every two or three hours, are each of value. Prof. Bartholow declares that *lithii bromidum* is almost a specific in muscular rheumatism.

For the *pain* and consequent sleeplessness, use—

℞. Pulv. ipecac. et opii, ... gr. x .6 Gm.
Potass. nitrat., ... gr. v–x .3–.6 Gm. M.
Sig.—In powder, morning and night.

Or, hypodermically, at the seat of pain, *morphinæ sulphas*, gr. ⅛–¼ (0.008–0.016 Gm.), and *atropinæ sulphas*, gr. $\frac{1}{80}$ (0.0008 Gm.), p. r. n.

In attacks where the disease is limited to a few muscles, the following liniment is valuable:

℞. Ol. gaultheriæ, ... ℥iss 6. Cc.
Spirit. vini rectif., ... f℥ij 60. Cc. M.
Sig.—Thoroughly rub into affected part.

In all forms, but more particularly in lumbago, a few dry cups over the seat of the pain give immediate relief.

Wonderful results have followed the use of the *hot-air apparatus* in acute and subacute lumbago.

Chronic cases: Rest, flannel worn next to the skin, stimulating and anodyne liniments, mild galvanism, dry heat, as ironing over the affected part with a common flat-iron, a piece of paper or towel being placed next to the skin.

Internally, *potassii iodidum*, *ammonii hydrochloras*, *sulphur*, *guaiacum* or *arsenicum* variously combined.

RHEUMATOID ARTHRITIS.

Synonyms. Arthritis deformans; rheumatic gout (?).

Definition. A destructive disease of the joints, accompanied with but slight fever, without suppuration; progressive in character, causing nearly symmetrical enlargement and deformity of various articulations.

Causes. The neuro-trophic theory, as advocated by Mitchell (J. K.) and supported by Charcot, is accepted as the predisposing cause. Among the exciting causes are bad hygiene, exposure, injury, prolonged lactation, frequent pregnancies, menopause, grief, tubercular diathesis, and following attacks of articular rheumatism. More common in women than men. A disease of middle life.

Pathological Anatomy. It is not rheumatism, as the blood contains no *lactic acid*. It is not gout, as *uric acid* is not found in the blood nor *urate of sodium* in the joints.

At first rheumatoid arthritis is attended with hyperæmia of the affected synovial membrane and increase of the synovial fluid. Soon the capsular ligament becomes irregularly thickened, the synovial fluid decreasing. If the process continue, the internal ligament is destroyed, thus allowing dislocation to occur. The interarticular fibro-cartilages ulcerate and disappear, as do the cartilages covering the ends of the bone, the ends of the bones becoming smooth and eburnated, and often greatly enlarged.

Symptoms. Either *acute* or *chronic*, the latter more frequent.

Acute form involves several joints at the same time, and is attended with slight pyrexia.

Chronic form slowly involves one joint, which seemingly soon recovers, and is attacked again, and may never recover, but grows progressively worse.

The *joint* slowly *enlarges*, is *painful*, movement exciting *neuralgic pains* along the limb. Soon the articulations become *rigid* or slightly movable after prolonged attempts, are more or less distorted and flexed, with nodules (Heberden's nodosities) on the sides or ends of the distant phalanges. Redness and tenderness are wanting. The muscles of the affected limb waste, giving the joint a greatly hypertrophied appearance. *Crepitation* is distinct after ulceration has destroyed the cartilage.

The hands are first involved, the disease spreading symmetrically from articulation to articulation, until in severe cases every joint is deformed.

Diagnosis. *Chronic articular rheumatism* is often confounded with rheumatoid arthritis; but the former lacks the marked structural changes and the progressive involvement of joint after joint.

Gout differs from rheumatoid arthritis by the presence of deposits of urate of sodium in the joints, the ears, tips of fingers, and the bursæ over the olecranon process of the elbow, the presence of uric acid in the blood, and the decided history of acute paroxysms.

Gonorrhœal rheumatism, so-called, has symptoms akin to rheumatoid arthritis, but the history of urethral suppuration clears up the diagnosis.

Paralysis agitans, when pronounced, might be confounded with rheumatoid arthritis if the examination were limited to the joints; but the whole history, such as the tremor, the gait, etc., should prevent error.

Prognosis. If early treatment be instituted, the disease may be held in abeyance for several years. After pronounced structural changes have begun, the malady is incurable, although it may remain stationary for a long time.

Treatment. If treatment be instituted before serious structural lesions have occurred, the author has seen benefit in many cases by the following plan: *Oleum morrhuæ* carefully and thoroughly rubbed into the affected joints three times a day, with the internal use of *lithii citras effervescentes*, ʒj (4 Gm.), three times a day, and the following tonic mixture:

℞.	Massæ ferri carbonat., ... gr. v	.3	Gm.
	Liquor. potass. arsenit., ... ♏v	.3	Cc.
	Vini xerici, ... fʒj	4.	Cc.
	Aquæ distill., ... fʒj	4.	Cc.

After meals, well diluted.

I have had some success from painting the joints when painful with the following combination, using at the same time *guaiacol carbonat.*, gr. v–x (0.3–0.6 Gm.), three times daily:

℞.	Guaiacol, ... 1 part	
	Tinct. iodi, ... 6 parts.	M.

Sig.—Paint over joints twice daily.

Complete recoveries are reported from the long-continued administration of small doses of *liquor potassii arsenitis.*

Attention to diet and hygiene are most important and valuable. When structural changes have destroyed portions of the joint, palliative treatment is the chief indication.

GOUT.

Synonyms. Podagra, gout in the foot; chiragra, the hand; gonagra, the knee.

Definition. A constitutional disease, usually inherited; characterized by the sudden occurrence of a paroxysm of severe pain and swelling in one of the smaller joints,—the great toe usually,—with the presence of uric acid in the blood, and the deposit of the urate of sodium in the structure of the joint.

Causes. *Predisposing:* inherited, male more than female—women after menopause.

Exciting; malt liquor and wine drinking; large consumption of animal food; lead poisoning; winter season.

When an inherited tendency, may begin early in life; when an acquired tendency, after thirty-five years.

The pathological cause consists in the presence of an excess of *uric acid* in the blood in the form of *urate of sodium.*

Pathological Anatomy. Gout is characterized by the deposit of *urate of sodium* from the blood into the structure of joints and tissues that are not very vascular. The deposit is associated with signs of inflammation—to wit: hyperæmia, redness of the surface, with swelling and effusion in and around the affected joint. The surfaces of the joint are incrusted with chalk-like masses, consisting of urates, which become greater with each attack, finally causing great deformity.

The deposit usually begins in the metatarso-phalangeal joint of the great toe, but other and many joints are soon affected.

The deposits may also be found in the knuckles, eyelids, and cartilages of the ear.

"Crystals of urate of soda are deposited in the tubules and intratubular tissues" of the kidneys—"gouty kidney"—and may be seen by the naked eye, the kidneys becoming small, granular, and fibrous.

Hypertrophy of the left ventricle and of the arteries, ending in atheromatous changes, are results of gout.

Symptoms. *Acute gout* is rare in the United States. It occurs in paroxysms; one year's interval between the first and second attack; six months usually between the second and third, after which it may occur at any time.

Prodromes usually precede the paroxysm for several days, to wit, acid dyspepsia, constipation, headache, and lassitude.

The *paroxysm* begins suddenly, between midnight and 2 A. M., with acute *pain* in the ball of the great toe, which becomes *red, hot, swollen*, and *so sensitive* that the slightest touch cannot be borne.

The veins are filled, the foot, ankle, and leg swollen, and the limb the seat of sudden spasmodic contractions, which increase the suffering; slight relief is afforded by elevating the limb. Associated with the local symptoms are *chill, fever*, quickened *pulse, thirst, coated tongue, constipation*, and *scanty, acid*, high-colored *urine*, which deposits, on cooling, a heavy *brickdust* sediment.

Towards daylight the symptoms ameliorate, to return again at sundown, the severity gradually lessening, until the fourth or fifth day, when convalescence is established, the patient, as a rule, feeling better than before the attack.

Chronic Gout. Either the result of acute attacks or with a greater number of joints being attacked.

The *paroxysms* occur at any time, but develop slowly, with less pronounced local and general symptoms. Deposits are noticed, the joints becoming hard, knobby, and often distorted. The deposits or *chalk-stones* (urate of sodium) occur about the joints, tendons, and bursæ, and helix of the ear.

Diagnosis. An error cannot occur if the history of the case can be obtained, to wit: hereditary tendency, age, sex (females rare, until menopause), mode of living, character of symptoms, and presence of the characteristic deposits.

Prognosis. Acute gout rarely fatal; is prone to return, but much depending upon the mode of living.

Chronic gout decidedly shortens life. The most serious signs are those indicating advanced renal disease, with non-elimination of uric acid. Gout influences unfavorably the prognosis from acute diseases or injuries.

Treatment. For the *acute paroxysms*, at once, *vinum colchici*

radicis, gtt. xv–xx–xxx (1–1.3–2 Cc.), every two hours, *well diluted*, either alone or in combination with a *potassium* salt, or *sodii salicylas*, gr. xx (1.3 Gm.), every two to four hours, well diluted, until relief or ringing in the ears occurs. While the acute symptoms of gout are not so rapidly relieved by *sodii salicylas* as are those of acute rheumatism, still it is an invaluable remedy and is rapidly succeeding colchicum. After the decrease of the acute symptoms, lessen the dose, but continue the remedy for some time.

Dr. Bartholow recommends the following pill:

℞. Colchicinæ, ...	gr. $\frac{1}{10}$	.0013	Gm.	
Ext. colocynth. comp., ...	gr. ss	.032	Gm.	
Quininæ sulph., ...	gr. iij	.2	Gm.	M.

Every two or three hours.

For the *pain*, hypodermic injection of *morphinæ sulphas*, and wrapping the inflamed joint in cotton-wool saturated with *liq. plumb. subacetat. dil.* and *tinctura opii*. The use of morphia in acute gout must be with caution, as many subjects have more or less contracted kidneys.

The diet must be restricted to milk and non-acid fruits, raw or cooked. The drinking of several ounces of water, hot or natural, every three hours, is most useful.

For subacute or lingering cases, and in chronic gout, *potassii iodidum* is valuable.

℞. Potassii iodidi, ...	ʒij	8.	Gm.
Vini colchici radicis, ...	fʒiv	15.	Cc.
Aquæ destil., ...	fʒiiss	75.	Cc. M.

Sig.—Teaspoonful, well diluted, after meals and at bedtime.

For *chronic gout*, regulated diet, free action on the secretions, and *lithii citras effervescentes*, ʒj (4 Gm.), three or four times a day, well diluted with water; and perhaps a course of *quinina*, *ferrum*, and *arsenicum*.

To prevent paroxysm, keep secretions acting by the free use of pure water or a good alkaline water, such as Buffalo lithia or Farmville lithia water, or Saratoga Vichy.

The diet is of the greatest importance, and should consist chiefly of vegetables and fruit, excepting tomatoes and strawberries, lemons and oranges; fresh meat must be discontinued for a time; oysters, fish, and soups may be used sparingly. Alcoholic and malt liquors

are contraindicated, as are tea and coffee; milk should replace all the above. No eggs or dishes containing eggs; no pastry, hot bread, or cakes; no sweetmeats, spices, or condiments.

Systematic exercise, especially walking, is of great advantage.

Cold bathing with caution, while the vapor or Turkish baths are of benefit.

Changing from a cold to a warm climate in winter, and the use of flannel underclothing, are strongly recommended.

DIABETES MELLITUS.

Synonyms. Glycosuria; melituria.

Definition. A chronic affection characterized by the constant presence of grape sugar in the urine, an excessive urinary discharge, and the progressive loss of flesh and strength.

Causes. Most common in males. More frequent in the Hebrew than the Christian. Rare in negroes. Occurs at all ages, but most frequently between twenty-five and fifty years. It is often hereditary. Disorders of the nervous, hepatic, and renal systems. Excessive use of farinaceous food and malt liquors. Sexual excesses.

The exact *pathology* of diabetes mellitus differs in different cases, and in the present state of knowledge no exclusive view can be adopted. Still, there are reasons for believing that, in a large proportion of cases, the nervous system is primarily at fault, though the character of the lesions may differ. Pavy believes diabetes mellitus originates in the nervous system, and probably as a vaso-motor paralysis. Disease or extirpation of the pancreas is followed by diabetes, and it is claimed the pancreas secretes a glycolytic ferment.

Pathological Anatomy. None peculiar to diabetes is yet recognized.

Hyperæmia and hypertrophy of the liver and kidneys are generally present, the result of increased functional activity. Various organic changes are found in the pancreas.

The changes in the lungs peculiar to phthisis are often found in very chronic cases.

The changes in the nervous system are not fully determined.

Symptoms. Clinically, cases differ greatly in their course and severity; one class presenting slight symptoms and a chronic course; another class having marked local and constitutional symptoms and

running an acute course. The symptoms of a typical case may be arranged under the following heads:

Urinary Organs and Urine. Micturition more frequent and the *urine increased* in quantity. *Pain* over the region of the kidneys.

The *quantity of urine* may amount to 4, 8, 12, 20, or 30 pints in twenty-four hours. It is usually *pale*, *clear*, and *watery*, having a *sweetish taste* and *odor*, the *specific gravity* ranging from 1.025 to 1.050. It ferments rapidly if kept in a warm place. It yields *grape sugar* to the usual tests, the amount present varying from *an ounce to two pounds* in the twenty-four hours.

The urea and uric acid are increased. Albumin may be present.

The increased passage of a large quantity of saccharine urine causes a constant itching, burning, and uneasy sensation at the prepuce, along the urethra, and at the neck of the bladder; in females, itching and eczema of the vulva are common; in children, incontinence of urine is frequent.

Digestive Organs. An almost constant symptom is *thirst*, with a dry and parched condition of the mouth. At times the *appetite is excessive*, again absent. The breath may have a sweetish odor, the *tongue* irritable, red, and often cracked. *Dyspeptic symptoms* are common, and occasionally vomiting. The *bowels* are constipated, the stools pale and dry. At times diarrhœa may occur.

The patient complains of feeling *very weak*, languid, and of *soreness and pain in the limbs;* there is more or less *emaciation*, a harsh, dry *skin*, the *countenance distressed and worn.*

The mind is often greatly altered; depression of spirits, decline in firmness of character and moral tone, with irritability, are present. Sexual inclination and power are greatly diminished. Defects of vision are present.

The blood and various secretions contain sugar.

Complications. Pulmonary phthisis; Bright's disease; defects of vision from atrophy of the retina or the formation of a soft cataract; boils and carbuncles, and chronic skin affections, such as psoriasis and eczema.

Course. The clinical history varies in different cases. In the majority of instances the course is chronic, lasting for years, the symptoms beginning insidiously, and becoming progressively worse, with, at times, decided remissions. Occasionally the disease runs an acute course, death occurring within four or five weeks.

Termination. The majority of cases ultimately prove fatal, the symptoms markedly changing, the *urine* and *sugar diminishing* in quantity, the occurrence of *albuminuria, disgust for food and drink,* and the development of hectic fever and colliquative diarrhœa.

The fatal result usually arises from *gradual exhaustion* from blood-poisoning, leading to *stupor, ending in complete coma,* or occasionally to *delirium* or *convulsions,* or from complications.

Rarely death occurs suddenly from *uræmic convulsions* or *uræmic coma.*

Diagnosis. Diabetes mellitus only exists when *grape sugar* is permanently present in the urine. "It is not the quantity, but the persistence of sugar which constitutes diabetes."

With grape sugar in the urine, associated with more or less increase in the urinary flow, it should be mistaken for no other affection.

From *Bright's disease,* by the absence of dropsy, and of tube casts in the urine, and the constant presence of sugar in the urine; but the amount of albumin in the urine is never so great or constant in diabetes mellitus as in Bright's disease.

From *diabetes insipidus,* by the absence of sugar in the blood and urine, and the larger quantity of urine voided in polyuria.

Simple glycosuria differs from diabetic glycosuria in that the amount of sugar in the urine is not constant,—at one time being present, at another absent,—the amount of urine voided is never in excess of health; simple glycosuria is a disease of the aged; diabetic glycosuria usually appears under fifty years. Simple glycosuria often results from the inhalation of chloroform, the excessive use of chloral, and in the insane, also from excitement, or as one of the results of injuries to the head.

Prognosis. Most unfavorable as regards a cure, it being fairly questionable if complete recovery has ever occurred in a typical case. Still, decided amelioration may take place in the symptoms, and the progress of the malady be greatly retarded. The younger the patient, the more rapid the fatal termination.

Treatment. Impress upon patients the importance of a strictly *regulated diet.* Prohibit or restrict the consumption of such articles as contain *sugar* or *starch,* especially ordinary bread or flour, sugar, honey, potatoes, peas, beans, rice, arrowroot, cracked wheat, oatmeal, turnips, beets, corn, and carrots, prunes, grapes, figs, bananas, pears, apples, and liquors of all kinds, whether distilled or fermented.

The main diet should be of *animal food*, including meat, poultry, game, and fish.

A moderate amount of fluids should be allowed, and in a majority of cases *milk* will prove beneficial, although, theoretically, contraindicated. Tea, coffee, and cocoa, without sugar, may be allowed in moderation, *glycerin* or *saccharin* being used as a substitute for the sugar.

Regulated exercise is of importance. The patient should wear flannel, and have two or three warm baths every week, or an occasional Turkish bath.

Therapeutical treatment. It is difficult to estimate correctly the action of any drug in this disease, for, as is well known, a proper modification of the diet will alone produce the most marked improvement.

Opium exercises an influence over the excretion of sugar, but the effect is not always maintained. Pavy strongly urges the use of *codeina* in doses of gr. ss–iij (0.032–0.2 Gm.), three times a day, gradually increased. The use of *morphinæ hydrochloras*, gr. j (0.065 Gm.), daily, or *pulvis opii*, gr. iij–v (0.2–0.3 Gm.), daily, is a favorite prescription. Prof. Da Costa suggests the use of *ergota*, which has decreased the urinary discharge and the quantity of sugar in a number of cases. Prof. Bartholow has met with an apparent cure by *ammonii carbonas*. *Uranii nitras*, gr. iij (0.2 Gm.), three times daily, will often markedly reduce the urine and sugar, and *sodii salicylas*, gr. xv (1 Gm.), three times daily, will markedly control the formation of sugar. *Liquor bromini arsenitis*, ♏iij–v (0.2–0.3 Cc.), three times a day, often gives good results. Dickinson remarks that "*strychnina* is, of all remedies, the most constantly useful." *Potassii bromidum*, ʒj (4 Gm.) during the twenty-four hours, is strongly urged. The following remedies are recommended by different observers—to wit: *pepsinum*, *liquor potassii arsenitis*, *iodum*, *potassii iodidum*, *acidum lacticum*, *glycerinum*, *quinina*, and *tinctura cannabis indicæ*. Cures are reported from *pulvis jambul seeds*, gr. v–x (0.3–0.6 Gm.), three times daily. Also *methylene blue*, gr. viij (0.52 Gm.), per diem. The evidence in favor of the majority of these drugs is far from satisfactory.

For *diabetic coma*, alkalies are particularly indicated. Sodium carbonas subcutaneously, or by intravenous injection, watching closely the effect on pulse and heart, as recommended by Stabelman. The use of large quantities (quarts) of the normal salt solution by means of *hypodermoclysis*, and slowly thrown into the large bowel, is a most valuable aid to elimination. Use also inhalations of oxygen and diuretics and fluids to promote elimination of toxic products.

Symptomatic treatment is mostly called for. For emaciation and anæmia, *ferrum* and *oleum morrhuæ;* for sleeplessness and restlessness, *morphinæ sulphas*, *potassii bromidum*, *chloral*, or *hyoscinæ hydrobromas*. For boils and carbuncles, *calcii sulphidum*. Duchenne suggests the following solution for the *excessive thirst* of diabetic patients:

℞. Potassii phosphat., ... two parts.
Aquæ, ... seventy-five parts.
Sig.—One teaspoonful twice or thrice daily, in wine or hop tea.

The dyspepsia and lung symptoms must be managed on general principles.

The constant *galvanic current* has been productive of good results. A change of scene and air is beneficial.

Surgical operations should on no account be undertaken on diabetic patients.

DIABETES INSIPIDUS.

Synonyms. Polyuria; polydipsia.

Definition. An affection characterized by the excessive secretion of a very large quantity of pale, watery urine, free from albumin and sugar.

Causes. Occasionally hereditary, or diabetes mellitus may have existed in the parent; more common in children or young adults; men are more liable than women; injuries and diseases of the nervous system; hysteria; exposure to cold; drinking freely of cold water; fatigue; prolonged debility; malaria; syphilis.

The probable immediate cause of the excessive secretion of urine consists in dilatation of the renal vessels, the result of paralysis of their muscular coat, caused by derangement of innervation, as the condition can be induced experimentally by irritating a spot in the fourth ventricle, or by section of portions of the sympathetic nerve.

Symptoms. The affection is characterized by *great thirst*, with an increased flow of pale, watery, slightly acid urine, the amount varying from *one to five or six gallons* in the twenty-four hours. The *specific gravity* ranges from 1.001–1.007. *Sugar and albumin are absent.* Urea and the other solids are increased. The *appetite* is voracious, the *bowels* are obstinately constipated, and the *skin* is dry and harsh.

The large flow of urine is usually preceded by various nervous phenomena, as *nervousness*, *irritability*, *inability to concentrate the mind*, *vivid imagination*, *a failure of memory*, *and headache*.

Unless the affection is soon arrested, great loss of flesh and strength result.

Diagnosis. It differs from *diabetes mellitus* by the absence of grape sugar in the urine.

From *paroxysmal diuresis*, by the absence of the increased urine permanently.

From *interstitial nephritis*, by the greater amount of urinary discharge and the absence of albumin, œdema, and casts, and the cardiac and vessel changes.

Prognosis. Rather unfavorable as to a radical cure, unless caused by syphilis. Death rarely is due to the diabetes, but to some intercurrent malady that the patient has been unable to withstand, on account of the weakness produced by the diabetes.

Treatment. If due to syphilis, *potassii iodidum* and *hydrargyrum* are of real benefit. Prof. Da Costa has had success with *ergota* in the form of the fluid extract or the aqueous extract. *Pilocarpus* has been used with success. Prof. Bartholow recommends *galvanism* in cases not cured by potassii iodidum, placing "one electrode to the neck below the occiput, the other to the hypochondriac region in turn." *Valerian*, *potassii bromidum*, and *sodii salicylas* have been used. The author has effected a cure in three cases, where other remedies had failed, by the use, internally, of—

℞. Strychninæ sulphatis, ...	gr. $\frac{1}{48}$	.0015	Gm.	
Acid. hydrochlor. dil., ...	♏x	.6	Cc.	
Aquæ lauro-cerasi, ...	f℥ij	8.	Cc.	M.

Well diluted.

The obstinate constipation is best overcome by *pilulæ catharticæ compositæ*, one at bedtime.

LITHÆMIA.

Synonyms. Lithiasis; uric acid diathesis; uricæmia; American gout.

Definition. A condition to which the fluids of the body are saturated with nitrogenized waste, in the form of *lithic* or *uric acid;* characterized by marked dyspepsia, various nervous phenomena,

muscular and articular pains, bronchial catarrh, all or any of these associated with scanty, high-colored, acid urine.

Causes. High living, with little exercise; imperfect digestion of nitrogenized food; impaired elimination of uric acid. The direct or remote offspring of the gouty are most frequently the victims.

Pathology. Not yet clearly determined. The non-elimination of certain products which have a deleterious influence upon the nervous system. That uric acid does exist in the blood is now generally accepted.

Symptoms. Those of *dyspepsia*, associated with *irregular bowels*, scanty, high-colored, *acid urine*, sp. gr. 1.024–1.028, containing neither sugar nor albumin, but showing an *increased* proportion of *urates* or uric acid, or both, and oxalate crystals. Also *depressed spirits, impaired memory, loss of interest in occupation, sleepless nights*, attacks of *vertigo*, neuralgic *pains* in the head, and a constant dread of apoplexy or cerebral disease. Also *pains in the joints*, neuralgic in character, and in the dorso-lumbar region and right scapular region.

If the condition be allowed to continue, the following organic changes may result—to wit: fatty heart; fibroid kidney; enlarged liver, or changes in the cerebral vessels.

Diagnosis. From gout, by the absence of acute paroxysms and resulting changes in the joints.

Prognosis. If properly recognized and treated, complete recovery will result, although it is a disorder of long duration.

If not properly treated, develops some one of the organic diseases mentioned.

Treatment. Regulated diet, using fresh meat once daily, poultry, game (plainly cooked), fresh fish, oysters, occasionally eggs, lettuce, spinach, celery, cold slaw, and tomatoes; avoid all kinds of starchy and saccharine foods, also all stimulants, tea and coffee, using milk, skimmed milk, or milk and cream. Act freely on all the secretions, particularly the liver and kidneys. Systematic exercise. Avoid tonics, bromides, chloral, and opium. Long course of alkaline waters, particularly the lithia waters. Intestinal antiseptics are valuable, such as *salol*, gr. j (0.065 Gm.) three times daily, or *potassii permanganas*, gr. j (0.065 Gm.) in coated pills after meals. Good results follow *lithii citras*, gr. xx (1.3 Gm.), t. d., *sodii phosphas*, gr. xxx–lx (2–4 Gm.), ter die, or *acidum benzoicum*, gr. x (0.6 Gm.), t. d., all well diluted with water. One of the very best drugs is *acidum nitricum dilutum*,

ℳx (0.6 Cc.) in half a glass of water, four times a day, with the occasional use of *pilulæ rhei compositæ* at bedtime. Considerable success has been obtained with *piperazine*, gr. x–xv (0.6–1 Gm.) in solution, after meals. *Strontium* has acted nicely in several cases.

℞. Strontii bromidi puræ, ... gr. xxx 2. Gm.
Glycerini, ... ℳxxx 2. Cc.
Infus. gentianæ, ... f℥iss 6. Cc. M.
SIG.—Before meals, well diluted.

CHOLERA.

Synonyms. Epidemic cholera; Asiatic cholera; malignant cholera; spasmodic cholera.

Definition. An acute, specific, infectious disease, epidemic in the majority of, although endemic in other, localities; characterized by the transudation of serum into the stomach and intestinal canal, and violent purging of a peculiar, rice-water-like fluid, the persistent vomiting of a similar material, severe muscular cramps, and a condition of prostration, followed by collapse and death, or of a reaction from the collapse and the development of the typhoid state (*cholera typhoid*).

Causes. A *specific poison*, the "comma bacillus" of Koch. Cholera is but feebly *contagious*, in the usual acceptation of that word, but it is unquestionably *infectious*.

The evidence seems conclusive that the *cholera stools* are the main, if not the only, channel of infection, and that the great cause of the propagation of cholera is the contamination, with the cholera stools, of the water used for drinking purposes. Milk may also be the vehicle by which it spreads. It is claimed that the bacillus is inert in the intestinal canal unless the individual is in the "receptive state"—that is, a condition of intestinal catarrh, such as results from eating unripe fruit, beer and spirit drinking, and indigestible food. It is also determined that the bacilli are destroyed by acids, and that if the stomach be normal, cholera will not result. "With pure water, pure air, pure soil, and pure habits, cholera need not be feared." (Hart.)

Little, if any, danger exists from being in the presence of the affected, although the emanations from the cholera excreta in the atmosphere may generate the disease if swallowed or inhaled. The dead bodies of cholera subjects apparently possess slight infective property, "the bacteria of composition" probably destroying the cholera germs. One attack does not afford protection against another.

The *period of incubation* is short, under a week, usually.

Pathological Anatomy. This is, as yet, far from satisfactory. The morbid appearances in the majority of cases of death from cholera may be thus summarized. The temperature generally rises after death, the body remaining warm for a considerable time. Rigor mortis rapidly ensues, the muscular contractions being often so powerful as to displace and distort the limbs. The skin is mottled and the body greatly shrunken. The blood is darker in color, thick, viscid, feebly coagulable, and slightly acid. The arteries are quite empty of blood; the veins, on the other hand, are distended. The organs are, as a rule, pale and shrunken.

The stomach and intestinal mucous membranes are congested, and present evidence of extravasation and ecchymoses, or are bleached and pale. The stomach and intestines usually contain a quantity of whey-like material, having an alkaline reaction, as well as quantities of cast-off epithelium and the bacillus. It is thought by many that the stripping-off of the epithelium is a post-mortem phenomenon. The Peyer's solitary and Brunner's glands are usually enlarged and prominent, and occasionally evidences of ulceration are apparent in the solitary glands, and sections placed under the microscope show the "comma bacillus." The villi of the mucous membrane, as well as the epithelium of the small intestines, are stripped off, leaving the basement membrane, for the most part, exposed. The *liver* is more or less advanced in fatty degeneration, presenting a somewhat mottled, yellowish discoloration. The *kidneys* are congested, the epithelium of the tubules granular, and detached from the basement membrane, blocking up the tubes. Prof. Bartholow observed, in all of his autopsies, "considerable hyperæmia and dilatation of the vessels of the medulla oblongata. The constancy of this lesion would seem to indicate a relationship between congestion of the medulla and the cramps."

Symptoms. In accordance with the law of epidemic infectious diseases, the onset, course, and character of the symptoms vary in different cases and at different periods in the same epidemic.

The disease may either set in suddenly in a patient previously in good health, or it may follow an attack of rather severe and persistent diarrhœa, with *pain, nausea, vomiting, and depression.* Such cases are termed *Cholerine,* the stools of which are infectious.

In a typical case there are three stages: *first,* diarrhœa; *second,* prostration; *third,* collapse, or, in favorable cases, reaction.

First Stage. Begins with *chilliness*, excessive *thirst*, coated tongue, unpleasant taste in the mouth, slight abdominal *pain*, and three or four copious, *watery*, yet fæcal *stools* during the day, and a decided feeling of *weakness*, the stools rapidly becoming *whey-like*, easily voided, but with force and only slight pain.

Second Stage. The *stools* rapidly increase in number, are voided with a rushing force, and consist of many quarts of grayish, or whitish, *rice-water-like* fluid, accompanied with forcible *vomiting*, first of the contents of the stomach, mixed with more or less bilious matter, afterward of the peculiar rice-water-like material; *thirst* becomes most intense, increasing or diminishing with the variations in the number of the vomiting and stools; severe *muscular cramps* soon follow, most severe in the calves, although occurring in all parts of the body.

Third Stage. The stools, vomiting, and cramps continue. The appearance of the patient becomes frightful; the eyes are sunken and surrounded by blackened rings, the nose pinched and pointed, the cheeks hollow, and the lips blue (facies cholerica); the surface cold and moistened with a sticky perspiration; the skin of the hands and fingers has the sodden appearance of the "washerwoman who has washed all day," and if picked up in folds, the fold but slowly disappears. The *temperature* rapidly falls, the *pulse* becomes small and compressible, barely perceptible at the wrist, and the heart-beats are scarcely recognizable. The *voice* is weak, husky, and sepulchral (vox cholerica), the tongue is like ice, the *breath is cold* and *icy*, the *urine* markedly diminished and albuminous. The *mind* is clear, but most patients are apathetic and indifferent to their danger. This, the *algid* state of cholera, or *cholera asphyxia*, usually terminates in death in from three to twelve, twenty-four, or forty-eight hours, but *reaction* may be established.

Stage of Reaction. The temperature of the body rises, the pulse gradually becomes fuller and stronger, the countenance becomes brighter, the stools less frequent and more fæcal, the vomiting decreases, the thirst lessens; the urine increases in amount, but continues albuminous, the patient entering a slow convalescence, or *typhoid symptoms* develop, the so-called *cholera typhoid*, which prolongs the recovery for several weeks.

Convalescence is often prolonged and complicated by the development of severe bed-sores, boils, bronchitis, pneumonia or parotitis.

Sequelæ. Suppuration of the parotid gland; painful tetanic contraction of the flexor muscles of the limbs; abscesses or ulcers of the limbs; profuse sweats; roseola, erythema, urticaria, and rarely vesicular eruptions.

Diagnosis. The epidemic character and rapid spreading and great mortality of the affection prevents its being mistaken for any other disease, although isolated cases are often confounded with cholerine or with cholera morbus, the points of distinction being few, unless the "comma bacillus" only be found in the stools of true cholera.

Prognosis. Very unfavorable, the mortality ranging from twenty to eighty per cent. The last epidemic in this country was much milder than former ones. The prognosis is controlled by the general condition of the patient, the age, habits, and the development of the algid state; the prognosis being more favorable in those cases which develop gradually than in those in which it reaches its acme at a single bound; the very young or very old, those addicted to the various excesses and surrounded by unfavorable hygienic conditions, are more apt to perish than are others.

Treatment. The success depends, to a great extent, upon its prompt and early treatment, for experience amply attests that the arrest of the disease in the diarrhœal stage is comparatively easy, and in the stage of collapse its cure is altogether an exceptional occurrence; therefore, during the prevalence of cholera the mildest cases of diarrhœa ought to receive prompt treatment, for many cases have their beginning as a mild diarrhœa.

It must not be overlooked that intelligent nursing and regimen are equally as important as medical treatment.

The patient should be put to bed at once, and all food withheld for a time at least. Small pellets of ice may be allowed instead of water.

"Of all the remedies proposed for the arrest of the diarrhœa, not one has done so much good as sulphuric acid. It is usual, and generally best, to combine some opium with it (℞. Acid. sulphuric. aromat., f℥v (20 Cc.); tinct. opii deodorat., f℥iij (12 Cc.). M. Sig.—Ten to twenty drops every hour or two in sufficient water)." (Bartholow.)

Large doses of *bismuth* should be of value in this early stage, but *opium* is particularly indicated, preferably in the form of morphinæ sulphas, hypodermically. During the epidemics of 1892–'93, good re-

sults were reported from the internal use of *hydrogen peroxide*, f℥ij (60 Cc.), with *aqua destillata*, f℥viij (237 Cc.), in cupful doses every two hours. *Salol* and *plumbi acetas* are of value for the early diarrhœa.

Ziemssen says: "Calomel has the first place of all drugs which have been recommended in the prodromal stage. Begin with two or three doses of gr. vij (0.45 Gm.), followed with small doses—gr. ¾ (0.048 Gm.)—every two hours."

It is now generally admitted that as the first symptoms of cholera are those of intestinal catarrh, direct medication ought to be of the greatest service. This is done by *enteroclysis* or irrigation of the canal with large amounts, from one to three gallons twice daily, of hot soaped water, hot four per cent. solutions of hydrogen peroxide, or weak solutions of tannin, or hot one per cent. solutions of common salt.

The enteroclysis is accomplished by means of a soft rubber tube, one metre in length and of suitable size, to be introduced into the rectum, in front of the promontory of the sacrum, into and up through the sigmoid flexure and into the descending colon. This tube, which is connected with a reservoir, should not be too small nor too large, in order to facilitate its introduction through the folds of the sigmoid portion of the lower bowel.

In fact, the greatest difficulty to be encountered is to successfully pass the tube in front of the promontory of the sacrum, and enter it into the sigmoid flexure. The tube should be of proper firmness to prevent it from bending or buckling upon itself when the end (which in all cases should be rounded) comes in contact with the obstructing folds of the intestine.

For the distressing vomiting, lavage of stomach with hydrogen peroxide, f℥ij (60 Cc.) to two or three pints of hot water, or *iced champagne*, *cocaine*, or *acidum hydrocyanicum* may sometimes give relief.

Locally, either *mustard* applications to the abdomen or the constant use of rubber bags filled with boiling water.

For the *cramps*, hot water in bottles, hot irons or bricks applied over painful parts, or an ointment of chloroform or chloral, chloroform or ether inhalations, or the use of the following hypodermic solution, strongly recommended by Prof. Bartholow:

℞. Chloral, ...	℥iij	12. Gm.	
Morphinæ sulph., ...	gr. iv	.26 Gm.	
Aquæ lauro-cerasi, ...	f℥j	30. Cc.	M.

Sig.—Fifteen to thirty minims each injection.

For the collapse, heat to the surface and the free use of *stimulants*, or *spiritus frumenti*, or *spiritus vini gallici*, hypodermically, also the hot bath, also *hypodermatoclysis* and the intravenous injection of saline fluids and hypodermic injections of strychninæ sulphas, gr. $\frac{1}{20}$ (0.003 Gm.). *Heat* is of the greatest value in all stages of cholera, both externally as very hot baths (hot air or hot water), and hot rectal injections.

If reaction occur, treat indications as they arise, and use tonics, such as *ferrum*, *quinina*, and *arsenicum*.

All the discharges from the patient should be thoroughly *disinfected* as soon as voided, and the stools and vomited material buried.

DISEASES OF THE RESPIRATORY SYSTEM.

PHYSICAL DIAGNOSIS.

Physical Diagnosis is the art of discriminating disease by means of the eye, the ear, and the touch.

The *signs* thus ascertained are connected with changes or alterations in the form, density, or condition of the structures within, and are known as *physical signs*.

"*Physical signs are, then, the exponents of physical conditions, and of nothing more.*" (Da Costa.)

The methods employed in the physical exploration of the chest, are: I, **Inspection**; II, **Palpation**; III, **Mensuration**; IV, **Percussion**; V, **Auscultation**; VI, **Succussion.**

Percussion and *auscultation*, dealing with sounds, are of the greatest value clinically.

For the purpose of physical exploration, the chest is mapped off into regions or divisions, as follows:

ANTERIORLY.

First.—*Supra-clavicular*, Lying above the upper edge of the clavicle, usually about an inch in extent.

Second.—*Clavicular*, Corresponding to the inner two-thirds of the clavicle.

Third.—*Infra-clavicular*, From the clavicle to the lower border of the third rib.

Fourth.—*Mammary*, Between the third and sixth ribs.

Fifth.—*Infra-mammary*, Downward from the sixth rib.

LATERALLY.

First.—*Axillary*, That portion above the sixth rib.

Second.—*Infra-axillary*, That portion below the sixth rib.

POSTERIORLY.

First.—*Supra-scapular*, That portion above the scapula.

Second.—*Scapular*, That portion covered by the scapula.

Third.—*Inter-scapular*, That portion between the scapulæ.

Fourth.—*Infra-scapular*, That portion below the angle of the scapula.

INSPECTION.

Inspection signifies "the act of looking." Views of the chest should be taken from the sides and behind as well as from the front, for which purpose a good light should be obtained, and the patient be placed in as easy and comfortable a position as is possible.

Inspection reveals the *form*, *size*, *color*, and *movements* of the chest, as well as the condition of the superficial parts.

In *health* the sides of the chest are for the most part *symmetrical* in form, size, color, and movements, both sides rising equally during the act of inspiration, and falling equally during the act of expiration. During the act of inspiration the intercostal spaces in the lower two-thirds of the chest become more hollow, as also do the supra-clavicular fossæ.

Inspiration is almost entirely the result of muscular action; *expiration*, on the other hand, is chiefly due to the elasticity of the lungs and chest walls, aided somewhat in forced respiration by muscular action. The movement of inspiration by inspection is of longer duration than that of expiration, and the pause between the acts but momentary.

The *respiratory movement* is visible over the whole thorax, although

in males and in children it is most distinct at the lower portion (*inferior costal breathing*), while in the female it is most distinct at the upper portion of the chest (*superior costal breathing*).

PALPATION.

By **palpation** is meant the application of the palmar surfaces of the hands and fingers to the chest, by means of which are appreciated impressions which are capable of being conveyed by the sense of touch.

The objects of palpation are:

First.—To give more accurate information of what is revealed by inspection.

Second.—To locate spots of soreness, the density and condition of tumors, if any be present; the state of the chest walls, the frequency of the breathing, and the action of the heart.

Third.—To determine the existence and character of the various kinds of *fremitus* (vibrations).

By **fremitus** is understood certain tactile impressions or vibrations conveyed to the surface of the chest, which are classed and produced as follows:

First.—*Vocal fremitus*, produced by the act of speaking or crying.

Second.—*Tussive fremitus*, produced by the act of coughing; of value especially when the voice is very weak.

Third.—*Bronchial fremitus*, produced by the passage of air through mucus, blood, or pus, in the bronchial tubes, during the act of respiration.

Fourth.—*Friction fremitus*, produced by the rubbing together of the roughened surfaces of the pleura.

When the normal chest vibrates lightly, it is termed the *normal vocal fremitus.*

The *vocal fremitus* is more distinct upon the right side toward the apex.

If the lung be consolidated (denser), the vibration is greater and more easily distinguished,—*the vocal fremitus is increased.*

In feeble persons, or when any cause interferes with the transmission of the vibrations, the *vocal fremitus is diminished* or absent.

MENSURATION.

Mensuration, or measurement of the chest, is of little practical importance, and hence seldom performed. The only measurement likely to be required is the *circular* or *circumferential*, in different parts of the chest, which is performed with either an ordinary graduated tape measure or a double tape measure, made by uniting two tapes in such a manner that they start in opposite directions from the same point at the *mid-spinal line*. The tapes drawn around each side until they meet at the *id-sternal line*, on a line immediately above the nipple, or on the level of the sixth rib near its attachment to the cartilage,—the sixth costo-sternal joint,—the patient first being directed to effect a complete expiration, the number of inches noted, and then to take a deep inspiration, the increase in inches noted, the difference between the two giving a rough estimate of the capacity of the lungs.

In right-handed persons the right side is usually one-half to three-fourths of an inch larger than the left; if larger than this, it is usually the result of some abnormal condition.

In well-developed men the chest measures at the upper part about thirty-three to thirty-five inches during expiration, and is increased fully three inches upon inspiration.

PERCUSSION.

Percussion, or "The act of striking," to ascertain the composition of structures, affords signs and information of great value in diagnosis.

There are two methods employed, *immediate* and *mediate*.

Immediate, or direct percussion, is performed by striking the thorax directly with the points of the fingers or the palmar surface of the hand. This method of percussion has been generally abandoned, as it does not enable the physician to distinguish, with sufficient correctness, between the various shades of difference in the pitch or quality of percussion sounds.

Mediate, or indirect percussion, may be practised in three different ways, to wit:

First.—With the finger of one hand interposed between the body percussed and the percussing finger.

Second.—With the finger acting as a pleximeter and the percussion hammer.

Third.—With the percussion hammer and the pleximeter.

The first of these modes affords the most correct and ready information regarding the *resistance* of the parts percussed. The skillful use of the fingers is more difficult to acquire than that of the pleximeter and hammer; but if the examiner has acquired sufficient skill in its performance, an absolutely accurate result may be obtained. "He who is skilled in digital percussion will be able to percuss equally well with the hammer, the inverse of which does not always hold good." In addition to being proficient in the technical *modus operandi*, it is necessary to possess a sensitive ear, educated to distinguish between the various shades of the sounds.

When the fingers are employed, it is a matter of choice whether one or more fingers are used as the pleximeter. Usually the last phalanx of the first or second fingers of the left hand are used, the other fingers being *raised from the chest, so as not to interfere with the sound vibrations;* they should be applied *firmly* and *evenly* to the surface, thus preventing the slipping of the soft parts, and also to determine the resistance of the chest walls when the blow is given. The *rounded ends* of the first and second fingers of the right hand are used as a hammer, striking the pleximeter fingers in such a manner that the nails shall not touch the skin of the underlying fingers. The force employed varies in different regions, but usually, for the chest, should be only of moderate degree. Forcible percussion is of use only when the sound of deep-seated organs is desired.

The *stroke* should be made perpendicularly to the surface, and not slanting, as is too often done. The whole movement should proceed only from the *wrist-joint*, and ought not to be too rapid or unequal, or of great force, the fingers being rapidly withdrawn, so as not to interfere with the vibrations.

The objects of percussion are to elicit certain *sounds*, and the amount of *resistance* or *elasticity* of the organs percussed.

The main sounds elicited by percussion are the *dull*, *clear*, and *tympanitic*. Familiarity with the *intensity*, *character*, and *pitch* of each of these sounds is essential.

When percussing the healthy chest, the sound obtained is termed the *normal pulmonary resonance*. It is of variable *intensity*, depending upon the force of the stroke employed and the amount of adipose

and muscular tissues covering the thorax, and the *tension* of the chest walls.

There is no exact standard of the normal pulmonary or vesicular resonance, but if the two sides of the chest are compared, the normal standard of each person is obtained.

The *character* is termed *pulmonary* or *clear*, as characteristic of the healthy chest wall. The *pitch* is always relatively *low*.

The sounds elicited by percussing a healthy chest are not, however, alike over all its parts.

Anteriorly, the portion of lung above the clavicle yields a sound which becomes somewhat *tympanitic* as the trachea is approached.

Over the *clavicle* the sound is *clear* and pulmonary at the centre of the bone, but at the scapular extremity it is duller, and toward the sternum it becomes somewhat tympanitic.

At the *infra-clavicular region* the resonance is *clear* and distinct, but little resistance being offered to the percussing finger, and the sound elicited may be taken as the type of the pulmonary resonance. In this region, however, a slight disparity exists between the two sides; on the right side the sound is less clear, shorter, and of a higher pitch than on the left side.

In the *mammary region* of the right side the resonance of the lung is not so clear, the sound being modified by the size of the mamma and the upper border of the liver. On the left side the heart deadens the sound from the fourth to the sixth rib, and, in a transverse direction, from the sternum to the left nipple. This dull sound in the left mammary region is lessened in extent during full inspiration, and in emphysema, when the lung more completely covers the heart.

In the *infra-mammary region* on the right side the percussion note is *dull*, except during the act of complete inspiration, when the liver is displaced downward by the inflated lung. In the left *infra-mammary region* the sound consists of a mixture of the dull sound of the heart and spleen and of the clear sound of the lung, together with the tympanitic sound of the stomach.

Over the upper part of the *sternum*—above the third rib—the sound is slightly *tympanitic*. Below the third rib, over the sternum, the sound is dull, due to the presence of the heart and liver.

The *position* exercises some influence on the results of percussion. More accurate results are obtained when the patient is standing or sitting than when recumbent. While the front of the chest is per-

cussed, the arms should hang loosely by the sides; the hands may be clasped across the top of the head during the percussion of the axillary region; during the examination of the back the head must be bent forward and the arms tightly crossed in front.

On the *posterior* surface of the chest the sound also varies according to the part percussed.

Over the *scapulæ* the sound is *duller* than between these bones or below their inferior angles.

Over the *infra-scapular region* a *clear* sound is obtained as far as the lower border of the tenth rib on the right side, where the dullness of the liver begins. On the left side, below the angle of the scapula, the percussion sound is tympanitic if the intestines are distended, or it may be slightly dull if the spleen is enlarged.

In the *axillary* region the sound is *clear* and distinct on each side.

In the *infra-axillary* region of the right side the sound is *duller*, owing to the presence of the liver; at the corresponding situation on the left side the sound is *clear* or *tympanitic*, from the distention of the stomach, and at the ninth or tenth rib of the left axillary region dullness and the sense of resistance mark the location of the spleen.

The sounds obtained by percussion of the *unhealthy* or abnormal chest are as follows:

First.—Hyper-resonance, or an increase of the normal pulmonary resonance, is due to the relative increase in the proportion of air to the solid tissues of the lung, provided the tension of the chest walls be not altered, occurring in emphysema of the lungs, atrophy of the lungs, or consolidation of the opposing lung.

Second.—Dullness or an absence of resonance, due to the relative increase of solid tissues in proportion to the amount of air, as seen in the different stages of phthisis, in pneumonia, pleural effusion, and hydrothorax.

The *pitch is increased or heightened* in proportion to the diminution of the amount of the air and the increase of the solids.

If there be entire want of resonance, the percussion note is said to be *flat;* if there is a slight decrease in the resonance of the part, the note is said to be *impaired.*

The sense of *resistance* is greater, the more marked the consolidation of the lungs and the greater the tension of the chest walls.

Third.—Tympanitic, or the drum-like percussion note, is a non-

vesicular sound having the character elicited by percussing over the normal intestines; wherever heard it indicates the presence of air in conditions similar to that of the intestines, to wit: inclosed in walls which are yielding, but neither tense nor very thick.

When elicited over the chest it may be due to the transmitted sound of the distended stomach or colon. It is obtained over the chest in pneumothorax, in moderate pleural effusions above the level of the liquid, over the seat of cavities in the pulmonary tissue, and in œdema of the lungs.

The *tympanitic* percussion note differs from the normal pulmonary resonance in being more ringing in character and of a *higher pitch*.

The *amphoric* or metallic sound is in reality a concentrated tympanitic sound of high pitch, and denotes a large cavity with firm, but yet elastic, walls.

The *cracked-pot or cracked-metal* sound is another variety of the tympanitic sound. The condition most frequently producing this sound is a cavity in the lung tissue, communicating with a bronchial tube. It requires for its development a strong, quick blow of the percussing finger, with the patient's mouth open.

RESPIRATORY PERCUSSION.

The percussion sound will vary greatly with the respiratory movements. If a full inspiration be taken and percussion performed, then a full expiration taken and percussion performed, and then the chest percussed during the normal respiration, slight changes in the character and pitch of the note are obtained, which otherwise would escape detection. Prof. Da Costa has designated this method, *respiratory percussion*.

AUSCULTATORY PERCUSSION.

This method consists in listening, with a stethoscope applied to the thorax, to the sounds elicited by percussion. "It is a serviceable means of determining with accuracy the boundaries of various organs, as those of the lungs or heart, or of the liver or spleen, and yields particularly exact results when carried out with the double stethoscope."

AUSCULTATION.

Auscultation, or listening to the sounds produced within the chest during the act of respiration, coughing, or speaking, furnishes the most reliable means of studying the condition of the lungs and heart, and is, therefore, the most valuable method of discriminating between the various conditions which may affect the lungs and heart.

Auscultation is either *immediate* or *mediate.*

It is *immediate* when the ear is applied directly to the chest, which may be either denuded or thinly covered.

It is *mediate* when the sounds are conducted to the ear by means of a tubular instrument, termed a *stethoscope.*

For ordinary purposes, *immediate* or direct auscultation is sufficient, but when it is desirable to analyze circumscribed sounds, as in diseases of the heart, or where the patient objects to this method, on the score of delicacy, or the auscultator objects, on account of the uncleanliness of the person examined, the stethoscope is to be preferred. Moreover, there are certain parts of the chest which can only be explored satisfactorily by the aid of a stethoscope, which instrument has the additional advantage of *intensifying* the sound.

In auscultation, the following rules, formulated by Prof. Da Costa, should be observed:

"1. Place yourself and your patient in a position which is the least constrained and permits of the most accurate application of the ear or stethoscope to the surface. Above all, avoid stooping, or having the head too low.

"2. Let the chest be bare, or, what is better, covered only with a towel or thin shirt.

"3. If a stethoscope be employed, apply closely to the surface, but abstain from pressing with it. This may be obviated by steadying the instrument, immediately above its expanded extremity, between the thumb and the index finger.

"4. Examine repeatedly the different portions of the chest, and compare them with one another while the patient is breathing quietly. Making him cough or draw a full breath is, at times, of service: especially the former, when he does not know how to breathe."

SOUNDS IN HEALTH.

If the ear be applied over the *larynx or trachea* of a healthy person, a sound is heard with both the act of inspiration and expiration. Its *intensity* is *variable*, its *pitch high*, and its *quality tubular* (to wit: a current of air passing through a tube—the larynx or trachea). The duration of the sound during inspiration being somewhat longer than during expiration. A *short pause* follows the act of expiration.

This sound is termed the *normal laryngeal respiration*, and is identical in character, duration, and pitch with an important morbid sound, termed *bronchial respiration.*

The sound heard by placing the ear over the lung tissue is different; it is produced in the very finest bronchial tubes and air cells by their expansion and contraction, and is termed the *normal vesicular murmur.*

The *inspiratory portion of the sound* is of *variable intensity*, its *pitch is low*, its *quality soft and breezy*, designated *vesicular;* its *duration* is during the entire act of inspiration.

The *expiratory portion of the sound* is not always perceptible; it is of *feeble intensity*, *very low pitch*, its *character soft and blowing*, and its duration much less than the act of inspiration.

It is to be remembered, however, that the vesicular murmur will be found to vary in the different regions on the same side, and in corresponding regions on the two sides of the chest. These variations within the range of health are especially important, and should be memorized.

Infra-clavicular Region.—The vesicular murmur in this region on either side is much more distinct than over any other part of the chest.

On the left side the *inspiratory sound* is of greater intensity, of *lower pitch*, and more distinctly vesicular in quality than that heard upon the right side. On the right side the *expiratory sound* is nearly or quite the same in length as the inspiratory sound, and is *higher in pitch* and more *tubular* in quality than the expiratory sound upon the left side.

Supra-scapular Region.—Owing to the small number of air vesicles and the large number of bronchial tubes, and their nearness to the surface, the respiratory murmur has an intense, high-pitched, tubular and expiratory quality.

Scapular Region.—Compared with the infra-clavicular region, the respiratory murmur heard over the scapulæ on either side is more feeble, and the vesicular quality less marked.

Inter-scapular Region.—The murmur in this region differs from the normal laryngeal breathing only in intensity and duration.

Infra-scapular Region.—The murmur in this region very closely resembles that heard in the left infra-clavicular region.

Mammary and Infra-mammary Regions.—The murmur in these regions differs from that heard in the infra-clavicular region, in being of less intensity.

Axillary and Infra-axillary Regions.—The respiratory sound in the axillary regions is as intense as in any portion of the chest. In the infra-axillary regions the intensity is less and the pitch lower.

VOICE IN HEALTH.

If the ear be applied over the larynx or trachea of a healthy person, and he be directed to count "twenty-one, twenty-two, twenty-three," in a uniform tone and with moderate force, there is perceived a strong resonance, with a sensation of concussion or shock, and a sense of vibration, thrill, or fremitus, the voice seeming to be concentrated and near the ear. Often the articulated words are distinctly transmitted (laryngophony).

The sounds thus heard are termed the *normal laryngeal resonance.*

If the ear or stethoscope be applied over the third rib anteriorly, on either side of the chest of a healthy person, and he be directed to count "twenty-one, twenty-two, twenty-three," in a uniform tone, with moderate force, a confused distant hum is perceived of variable intensity, accompanied with more or less vibration, thrill, or fremitus, most distinct in adults, but notably weaker in women than in men.

This sound is termed the *normal vocal resonance.*

If the ear or stethoscope be applied over the third rib anteriorly, of a healthy person, and he be directed to *whisper*, in a uniform manner, the words "twenty-one, twenty-two, twenty-three," there is heard a sound corresponding closely in character to the sound of expiration over the same region during the act of forced respiration; or, in other words, a feeble, low-pitched, blowing sound.

This sound is termed the *normal bronchial whisper*, and is produced by the movement of the air in the bronchial tubes during the act of respiration.

SOUNDS IN DISEASE.

The vesicular murmur may undergo, in disease, changes in its *intensity*, its *rhythm*, and in its *character*.

The **intensity** of the respiratory murmur may be:

1. *Exaggerated* or *increased*.
2. *Diminished* or *feeble*.
3. *Absent* or *suppressed*.

Exaggerated respiration differs from the normal vesicular respiration only in an increase in the intensity of the respiratory sounds. When general over one lung, it will usually indicate deficient action of other parts. In this manner an effusion compressing the lung, one-sided deposits, obstruction of the bronchial tubes by secretion, or inflammation of the lung structure, necessitate a *supplementary* respiration in a healthy portion of the same lung or the lung upon the opposite side. From its resemblance to the loud, strong, quick respiration of young children, it has been termed *puerile* respiration.

Exaggerated respiration is, therefore, to be regarded as indirect evidence of disease in some portion of the pulmonary tissue.

Diminished respiration, called also senile respiration, as being characteristic of old age, is characterized by diminished intensity and duration of the sound. In the large majority of instances the inspiration suffers the greatest, the expiratory sound not diminishing in the same proportion. In asthma, emphysema, diseases of the larynx and bronchial tubes, pleuritic pain, rheumatism or paralysis of the chest walls, or in thickening of the pleural membrane, we observe superficial or diminished respiration. When one side of the chest is *partially* filled with fluid, we may hear a deep-seated but feeble breath sound.

Absent or suppressed respiration occurs whenever the action of the lung is suspended; this may be from external pressure, as when the lung is compressed by the presence of fluid or air in the pleural cavity, or when complete obstruction of the bronchial tubes prevents the air from either entering or escaping from the lungs.

The **rhythm** of the respiratory murmur may be:

1. *Interrupted or jerky.*
2. *The interval between inspiration and expiration prolonged.*
3. *Expiration prolonged.*

In health the inspiratory and expiratory sounds are even and continuous, with a short interval between each act; this may be altered in disease, and both sounds, especially the inspiratory, have an interrupted or jerky character, termed "cog-wheel respiration."

This **jerky breathing** is noted in some spasmodic affections of the air tubes, in hysteria, the earliest stages of pleurisy, pleurodynia, and the early stages of pulmonary phthisis. It is most frequently associated with phthisis, due probably to the adhering to the walls of the finer bronchial tubes of tough mucus, which obstructs the free entrance and exit of the air; it is usually most notable under the clavicles.

The **interval between inspiration and expiration may be prolonged,** instead of these two sounds closely succeeding each other. When this occurs the inspiratory sound may be shortened, or the expiratory sound may be delayed in its commencement. If the inspiratory sound is shortened, it is the result of consolidation of the lungs; if the expiratory sound is delayed, it is the result of lessened elasticity of the lung structure, and is most commonly associated with emphysema.

Prolonged expiration denotes that the air is obstructed in its exit from the lungs. It may be the result of diminished elasticity, the result of emphysema, or from the deposit of tubercles, which impair the contractile power of the lungs. If the former, it is associated with clearness on percussion; if the latter, however, with impaired resonance on percussion. When prolonged expiration is detected at the apex of the lung, and is associated with impairment of the normal pulmonary resonance, it is for the most part the result of a tubercular deposit.

The **quality** of the respiratory murmur may be:

1. *Harsh,* termed *vesiculo-bronchial respiration.*
2. *Bronchial.*
3. *Cavernous.*
4. *Amphoric.*

Harsh respiration, or, as it is termed by Prof. Da Costa, *vesiculo-bronchial* respiration, is that variety in which both the inspiratory and expiratory sounds have lost their natural softness. It generally indicates more or less consolidation of lung tissue. In normal vesicular respiration the sounds produced by the air expanding the air cells and finer bronchial tubes obscures the sound produced by the passage of

air through the larger bronchial tubes, the healthy lung being an imperfect conductor of sound, so that as soon as any portion of the lung becomes consolidated the vesicular element of the respiratory sound is diminished, the bronchial element becoming prominent. *Harsh respiration* is, then, a union of the vesicular and bronchial sounds, being a vesicular sound mixed with some of the qualities of a bronchial sound, the expiration being prolonged and tubular in character. It is present when the bronchial mucous membrane is swollen, as in the earlier stages of bronchitis, also in the earlier stages of phthisis and pneumonia.

Bronchial respiration is characterized by an entire absence of all the vesicular quality. *Inspiration* is of *high pitch* and *tubular* in character; *expiration* still *higher in pitch*, of greater intensity, *prolonged* and *tubular* in quality; the two sounds being separated by a brief interval.

The bronchial respiration encountered in disease closely resembles that heard in health over the larynx or trachea. Whenever bronchial respiration is present where, in health, the normal vesicular murmur should be heard, it indicates consolidation of the lung structure.

Cavernous respiration is a variety of the bronchial respiration, at least so far as the quality of the sound is concerned. It is essentially a blowing sound, yet not always heard during both the acts of inspiration and expiration, being often only perceptible in the one, and in the other mixed with gurgling sounds. Its *pitch* is lower than that of ordinary bronchial respiration, and its *character* is hollow.

For its production there must be a cavity of considerable size in the lung substance, not filled with fluid, near the surface of the chest walls, communicating with a bronchial tube. It is met with most commonly in the last stages of pulmonary consumption, although hollow spaces of any kind, from abscess or dilatation of the bronchial tubes, occasion it.

Amphoric respiration is a blowing respiration, having a musical or metallic quality. It is a variety of bronchial respiration produced in a large cavity with firm walls, permitting the reflection of the sound. An imitation of this sound, though only an imperfect one, is produced by blowing over the mouth of an empty bottle. The amphoric character is present with both the acts of inspiration and expiration.

Amphoric or metallic respiration is indicative of a large cavity, not

common in phthisis, but much oftener heard at the upper part of a lung compressed by fluid and air, as in pneumo-hydrothorax.

RÂLES.

Râles, or, as they are termed, *adventitious sounds*, because they have no analogue in the healthy state, cannot be considered as modifications of the normal respiration.

Grouped according to the anatomical situation in which they are produced, we have:

1. *Laryngeal and tracheal râles.*
2. *Bronchial râles.*
3. *Vesicular râles.*
4. *Cavernous râles.*
5. *Pleural râles.*

Râles may be divided into two groups, according to their character, to wit: *dry* and *moist*, and may be audible either during the act of inspiration or expiration, or during both.

Dry râles, for the most part, are produced by the *vibration* of thick fluids which the air cannot break up, and which, therefore, temporarily lessens the calibre of the bronchial tubes. When this narrowing exists in the smaller bronchial tubes the resulting sound is *high-pitched* or the râle is said to be *sibilant* or whistling; when the narrowing exists in the larger bronchial tubes, the râle is *low-pitched*, more musical in character, or *sonorous*.

Dry râles are particularly prone to be dislodged by coughing, and when they are uninfluenced by the acts of breathing and coughing, they do not depend upon the presence of secretions, but upon the narrowing of the air tubes from the pressure of tumors, or from a thickened fold of mucous membrane, or from a spasmodic contraction of the air tubes.

Moist râles are those produced by the air passing through thin fluids, such as mucus, blood, serum, or pus, during the respiratory movements. When the fluid exists in the smaller bronchial tubes, the râles are termed *small bubbling*, mucous, or *subcrepitant.* When the fluid is in the large bronchial tubes, the râles are said to be *large bubbling* or mucous.

Moist râles are not persistent, but vary in intensity, and shift their

position as the air drives the liquid which occasions them before it, or during violent attacks of coughing, or after copious expectoration.

Laryngeal and tracheal râles are those produced within the larynx and trachea, and may be either moist or dry. The moist or bubbling sounds, produced when mucus or other liquids accumulate in this part of the air tubes, frequently occur in the moribund state, and are then known as the "death rattles." When not due to this condition they denote either insensibility to the presence of liquid, as in stupor or coma, or inability to remove liquid by the act of expectoration, as in croup or inflammation of these parts in the very feeble.

The dry râles produced within the larynx or trachea are generally caused by spasm of the glottis—to wit: laryngismus stridulus, whooping cough or croup, or from the presence of a foreign body in the part.

Bronchial râles, resulting from the passage of air through the thin liquid, occasion bubbling sounds. When the liquid is present in the large-sized bronchial tubes, the râles are said to be *large bubbling*, or large mucous râles, occurring in acute or chronic bronchitis.

When the liquid is in the smaller bronchial tubes, the resulting râle is called *small bubbling*, small mucous, or *subcrepitant*, also occurring in acute or chronic bronchitis.

Bronchial râles, due to the narrowing of the tube by its spasmodic contraction, or to the presence of tough, tenacious mucus, which is put into vibration by the passage of the air through the bronchial tubes, are termed dry bronchial râles. Frequently they are suggestive of certain familiar sounds, such as snoring, cooing, humming, or wheezing, or they are often musical tones. When produced in the smaller bronchial tubes, they are termed *sibilant*, or high-pitched râles; when produced in the larger bronchial tubes, they are termed *sonorous* or low-pitched râles. They principally occur in the dry stage of bronchitis, or during an asthmatic paroxysm.

The vesicular râle, or, as it is more commonly termed, the *crepitant râle*, is produced within the air vesicles or at the terminal portion of the smaller bronchial tubes.

It is to be distinguished from very fine bubbling sounds, or the subcrepitant râle. "*It is a very fine sound, or rather series of very fine uniform sounds, occurring in puffs and limited to inspiration.*"

(Da Costa.) It resembles the noise occasioned by throwing salt on the fire, or alternately pressing and separating the thumb and finger, moistened with a solution of gum arabic, and held near the ear, or rubbing together a lock of dry hair near the ear.

The *crepitant râle* is produced by the movement of fluid in the air cells or in the finest extremities of the bronchial tubes, or by the forcing open, during the act of inspiration, of the air cells agglutinated by exuded lymph. These sounds may be defined as being very fine, dry, crackling sounds, heard at the *end* of inspiration. They are usually present in the first stage of pneumonia, but when limited to the apices are significant of the incipient stage of phthisis.

Cavernous râles, or, as they are commonly termed, gurgling râles, are produced in a pulmonary cavity of considerable size, containing a large amount of liquid communicating freely with a bronchial tube. The sound is occasioned by the agitation of the liquid within the cavity, and may be compared to the sound produced by the boiling of liquid in a flask or large test-tube. The sound is sometimes high-pitched or musical, whence it has been termed "amphoric gurgling," but it is generally low in pitch. The râle is heard almost exclusively during the act of inspiration, and its diagnostic importance relates to the advanced stage of phthisis.

Pleural râles may be either dry or moist.

Dry pleural râles, or, as they are more commonly termed, *friction sounds*, are occasioned when the surfaces of the pleura are covered with a glutinous substance preventing the unobstructed movements of the pleural surfaces upon each other during the respiratory acts, for in health these movements occasion no sound whatever. The sounds are generally interrupted or irregular, occurring during the act of inspiration or expiration, or during both acts. The character of the sound is variable, being termed rubbing, grazing, rasping, grating, or creaking, according to the intensity of the respiratory acts and the amount of exudation.

They are distinguished by the apparent nearness of the sound to the ear, and are usually intensified by firm pressure of the stethoscope upon the chest. When the chest is fixed, especially at the lower two-thirds, and the ear applied over the seat of the sound, it will be found to have disappeared. The sound is diagnostic of the first stage of pleurisy or the pre-adhesive stage of tuberculosis of the pleura.

Moist friction sounds are produced in the same manner as those just mentioned, the exudation being softened in character. This sound is frequently confounded with moist bronchial râles, and its discrimination is often only positive by a careful study of the symptoms and concomitant signs present.

Metallic tinkling is a sign of pneumo-hydrothorax with perforation of the lung, and when found, is usually diagnostic of this affection, although it occurs rarely in cases of phthisis with a large cavity, the physical conditions for its production being similar to those in pneumo-hydrothorax—to wit: a space of considerable size containing air and liquid, the space communicating with the bronchial tubes.

It consists of a series of *tinkling sounds*, of high pitch, silvery or metallic in tone, and is very well imitated by dropping a small marble into a metallic vase. It occurs irregularly, not being present with every act of breathing, and may be produced by forced, when not heard during tranquil, breathing.

Were it not for the location and the absence of concomitant signs, it might be confounded with tinkling sounds sometimes produced within the stomach and transverse colon; these latter sounds must be kept in mind in ausculting the lower chest area.

THE VOICE IN DISEASE.

The normal vocal resonance, as heard over the third rib of the chest anteriorly on each side, may have its *intensity*—

1. *Diminished or absent.*
2. *Increased or exaggerated.*

Or its resonance may be of the character of—

3. *Bronchophony.*
4. *Pectoriloquy.*
5. *Ægophony.*
6. *Amphoric voice.*

The vocal resonance may be diminished or feeble in bronchitis with free secretion, pleurisy with effusion, or in complete consolidation of the lung structure and the bronchial tubes.

The vocal resonance is absent in pneumothorax and in pleurisy with effusion.

Exaggerated vocal resonance differs from the normal vocal

resonance in a slight increase of its density. It denotes a slight degree of solidification of lung tissue, and is chiefly of value in the diagnosis of tubercle.

Bronchophony, or the voice concentrated near the ear, raised in pitch and in intensity, denotes complete consolidation of the pulmonary tissue in those parts in which the sound is abnormally present.

Pectoriloquy is complete transmission of the voice to the ear, the articulated words being distinctly recognized. It has a close resemblance to the resonance heard over the larynx in health. Its presence indicates either a pulmonary cavity or more complete consolidation—in other words, an exaggerated bronchophony.

Ægophony is a modification of bronchophony, consisting in tremulousness of the voice, its character nasal or bleating, somewhat suggestive of the cry of a goat. When heard it may be considered a sign of pleurisy with slight effusion, or of pleuro-pneumonia.

Amphoric voice, or "the echo," as it is sometimes called, is a musical sound, of a somewhat hollow, metallic character, like that produced by blowing into an empty bottle. It is sometimes produced in large cavities within the lung, but is especially incident to pneumothorax.

Increased bronchial whisper is a sound in which the whispered words are abnormally intense, and higher in pitch than the normal bronchial whisper. It has the same significance as exaggerated vocal resonance.

SUCCUSSION.

The succussion or splashing sound is pathognomonic of one affection—namely, pneumo-hydrothorax.

It is obtained by jerking the body of a patient with a quick, somewhat forcible movement, the ear being very near or in contact with the chest.

The sound is like that produced when a small keg, partially filled with liquid, is shaken. The only liability to error is in confounding this splashing sound with that sometimes produced within the stomach; but attention to concomitant signs and the symptoms will always protect against this error.

ASSOCIATION OF THE PHYSICAL SIGNS (DA COSTA).

"As many of the signs elicited by the various methods of physical diagnosis depend on the same physical conditions, they may be studied in groups. The following will be usually found to be associated:

Percussion.	Auscultation of Respiration.	Auscultation of Voice.	Vocal Fremitus.	Physical Conditions.
Clear, ...	Vesicular murmur or its modification.	Normal vocal resonance.	Unimpaired.	Lung tissue healthy or nearly so; at any rate, no increased density from deposits, etc.
Dull, ...	Bronchial, or harsh respiration.	Bronchophony.	Increased.	Solidification of pulmonary structure.
	Absent respiration.	Absent voice.	Diminished or absent.	Effusion into pleural sac.
Tympanitic, .	Cavernous or feeble, according to cause.	Uncertain; cavernous or diminished.	Uncertain; mostly diminished.	Increased quantity of air within the chest, due to a cavity or to overdistention of the air cells.
Amphoric or metallic.	Amphoric or metallic.	Amphoric or metallic.	Mostly diminished.	Large cavity with elastic walls.
Cracked metal sound.	Cavernous respiration.	Cavernous respiration.	Uncertain.	Generally a cavity communicating with a bronchial tube.

DISEASES OF THE NASAL PASSAGES.

ACUTE NASAL CATARRH.

Synonyms. Acute rhinitis; acute coryza; "cold in the head."

Definition. An acute catarrhal inflammation of the mucous membrane (pituitary or Schneiderian membrane) lining the nose and the cavities communicating with it; characterized by feverishness, feeling of fullness and discomfort in the head, and attended with discharges of fluid, watery, mucous, or muco-purulent in character.

Pathological Anatomy. *Hyperæmia* of the mucous membrane, attended with redness, swelling, and deficient secretion. This tumefaction is partly increased by an *œdematous infiltration*, causing a quantity of colorless, salty, and very thin liquid to flow from the

nose. The secretion soon assumes the character of thick, tenacious mucus or muco-pus, due to the desquamation of the epithelium of the nasal mucous membrane, and a copious generation of young cells, the hyperæmia and the swelling of the membrane diminishing.

The respiratory portions of the nasal fossæ are more markedly affected than are the olfactory.

Rarely, and then in new-born infants and those affected with the eruptive fevers, the exudation in the nasal passages is of a fibrinous nature, somewhat similar to that observed in diphtheria.

Causes. Atmospherical changes are the most frequent and influential. Exposure of the neck to a draught of cold air, or of the feet and ankles to cold and dampness, or changing from a warm to a cold atmosphere suddenly, are among the most usual causes. Irritating gases and vapors, dust, certain powders, as ipecac and tobacco. The scrofulous taint and the rheumatic diathesis seem to render the mucous membrane susceptible to frequent attacks.

Acute coryza is usually present in the initial stage of measles and influenza; nearly always present in facial erysipelas.

Epidemic influence occasionally prevails on an extensive scale. The poison of syphilis or the use of the iodide of potassium not infrequently act as exciting causes.

At times the catarrh seems to spread by contagion.

Symptoms. "A cold in the head" is usually preceded by a feeling of *lassitude* or weariness and more or less frontal *headache;* then occur irregular *chilly sensations* in the back, followed by more or less *feverishness* and an uncomfortable feeling of *dryness* in the nares, with a strong inclination to *sneeze*. This is soon followed by an abundant *watery and saline discharge*, which is continually dripping from the nostrils, or occasions an attack of sneezing followed by blowing the nose, which relieves the congested and swollen membrane for a few moments. The relief is temporary, however, the fullness of the head and difficult obstructed nasal respiration rapidly returning. *The anterior nares are red and inflamed*, and the eyes red and suffused with tears, through partial or entire closure of the tear ducts. The *discharge* soon assumes a *puruleni* character. The *voice* has a peculiar tone, rather nasal and muffled in character. Within a few days the swelling subsides and secretion lessens, health being restored in about ten days from the beginning of the attack.

When the attack has almost terminated, hard crusts may form within the nostrils, either on the septum or turbinated bones, which are with difficulty expelled by blowing the nose.

Complications. *Irritation* and *swelling* of the upper lip, from repeated blowing of the nose and the constant contact of the irritating discharge.

Extension of the catarrh to the *ethmoid* or *sphenoid cavities* or *frontal sinus*, causing increased and severe frontal headache; or to the *antrum* of *Highmore*, causing tenderness over one or both cheeks.

Extension to the *Eustachian tube* and *middle ear*, causing impaired hearing; or the *pharynx* or *larynx*, causing cough.

Duration. In mild cases about one week; severe cases continue, more or less marked, for two weeks.

Prognosis. Favorable if early and proper treatment be instituted; if neglected, the catarrh tends to become chronic. In very young infants, if the catarrh is not rapidly relieved, loss of flesh and strength occur, from inability to nurse.

Treatment. Attacks the result of atmospherical causes may be aborted by the early administration of *quininæ sulphas*, gr. x–xv (0.6–1 Gm.), with *morphinæ sulphas*, gr. ¼ (0.016 Gm.), or the early use of *pulvis ipecacuanhæ et opii*, gr. v (0.3 Gm.), repeated in two hours. Buckley says an acute cold can be aborted by using *sodii bicarbonatis*, gr. xx (1.3 Gm.) in f℥ij (60 Cc.) of a hot fluid every half hour for three doses and the fourth dose in one hour.

The following *errhine* used at the very onset has proved successful in *aborting* many attacks:

℞. Alumenis,
Bismuthi subcarb.,
Pulv. camphoræ, ... āā gr. xx āā 1.3 Gm.
Morphinæ hydrochlor., ... gr. ij .13 Gm. M.
Ft. chart. No. xx.

Sig.—Insufflate one powder in each nostril after clearing the nose.

If the attack has already developed, relief is soon afforded by *tinctura belladonnæ*, ♏ij (0.12 Cc.), every hour until six doses are taken, after which one drop every two or three hours until the physiological actions of the drug are produced; if much fever be present, *tinctura aconiti*, ♏j–ij (0.06–0.12 Cc.), may be added; the addition of *camphora* is of value: in fact, camphora in full doses at the onset

and locally will often abort an acute catarrh. The following combination of Dr. Sajous is often successful:

℞.	Ammonii chlor., ...	℈ij	2.6	Gm.
	Tinct. opii, ...	♏xxx	2.	Cc.
	Sacch. alb., ...	ʒj	4.	Gm.
	Aq. camphoræ, ...	fʒj	30. Cc.	M.

Sig.—One teaspoonful in water every hour or two.

Attacks of acute rhinitis unaccompanied by febrile reaction are generally promptly aborted by a four per cent. solution of *cocainæ hydrochloras*, dropped in the nostrils, repeated every half hour:

With either of the above plans may be added one of the following *errhines:*

℞.	Bismuth. subnit., ...	ʒvj	24.	Gm.
	Pulv. acaciæ, ...	ʒij	8.	Gm.
	Morphinæ hydrochlor., ...	gr. ij	.13	Gm.

Sig.—Every hour or two. (Ferrier.)

Or—

℞.	Pulv. cubebæ, ...	ʒj	4.	Gm.
	Bismuth. subnit., ...	ʒij	8.	Gm.
	Morphinæ hydrochlor., ...	gr. ij	.13 Gm.	M.

Sig.—Used by *insufflation* every two or three hours.

Acute coryza occurring in infants at the breast is controlled by either one of the following errhines, thrown into the nose with a powder blower: finely powdered *saccharum purificatum* (white), or equal parts of finely powdered *saccharum purificatum* and *camphora*, or Robinson's errhine of *saccharum purificatum* and *camphora*, each half ounce (15 Gm.) finely powdered, and *acidum tannicum*, gr. xl (2.6 Gm.).

Attacks of nasal catarrh due to the poison of syphilis should at once be placed upon the proper constitutional treatment.

Attacks of nasal catarrh associated with the eruptive or mild fevers require no special treatment.

It is well to remember that attacks of nasal catarrh occurring in very young children are generally the result of hereditary syphilis, and should be treated accordingly.

CHRONIC NASAL CATARRH.

Synonyms. Chronic rhinitis; chronic coryza.

Definition. A chronic inflammation of the mucous membrane lining the nasal passages, with more or less alteration of structure; characterized by a sensation of fullness in the nares, increased secretion, and a perversion of the special sense of smell and of hearing.

Causes. The result of repeated attacks of the acute variety; inhalation of irritating vapors and dust; syphilis and scrofula.

Pathological Anatomy. The mucous membrane of the nares is *thickened*, of a *dark-red*, sometimes *grayish color*, the superficial veins dilated and varicose, often forming polypoid enlargements. In many cases there is *ulceration* of the structure, with more or less loss of substance; the secretion is thick, tough, of a greenish character, and often very fœtid; large collections of dried mucus are often formed upon the turbinated bones and septum.

Symptoms. A feeling of *fullness* in the *nares*, *increase* of the *secretion*, the character being thick and greenish, which, dropping posteriorly into the pharynx, causes paroxysms of "hawking," which are more marked in the morning immediately after rising.

The special *sense of smell* is more or less impaired, and in many instances entirely abolished; the *special sense* of hearing is more or less diminished, from an extension of the inflammation to the Eustachian tubes; the *voice* has a peculiar *nasal intonation*.

An almost constant dull *frontal headache*, associated with a feeling of weight, showing the extension of the disease to the infundibulum and frontal sinus.

Sudden changes of temperature cause acute exacerbation of these symptoms, when there is superadded difficult nasal respiration.

If *ulceration* of the nares occur, the discharge has a *fœtid odor*. This condition is termed *ozæna*.

From extension of the inflammation to the nasal duct or its obstruction, the tears flow over the malar eminence (*epiphora*), leading to more or less congestion of the eyes.

Diagnosis. Hypertrophy of the turbinated bones and naso-pharyngeal catarrh are constantly misnamed chronic nasal catarrh. The rhinoscope readily determines the diagnosis.

Prognosis. Permanent cure is seldom obtained; the disease

being so decidedly chronic and obstinate, the treatment is of necessity protracted, and the majority of patients tire of it before a complete cure is effected.

Treatment. If it depends upon diathetic conditions, the cause must be ascertained and treatment directed accordingly.

When no diathetic cause can be determined, attention should be paid to the general health, the secretions constantly attended to, and the diet be nutritious and digestible.

Cleanliness of the nasal passages is of the utmost importance, and is best effected by the *post-nasal syringe*, with either simple or medicated tepid waters, or a cleansing solution, such as Dobell's—to wit:

℞. Acidi carbolici,	gr. j	.065	Gm.
Sodii bicarbonat.,			
Sodii borat.,	āā gr. v	āā .3	Gm.
Glycerini,	f℥j	4.	Cc.
Aquæ,	f℥j	30.	Cc.

Sig.—As a spray or with a proper syringe.

Or the following combination of Dr. Sajous:

℞. Sodii bicarb.,				
Sodii bibor.,	āā gr. viij	āā .52	Gm.	
Ext. pinus canad. fld.,	♏ xv	1.	Cc.	
Glycerini,	f℥ij	8.	Cc.	
Aquæ,	ad f℥iv	ad 120.	Cc.	M.

Sig.—Apply with atomizer three or four times daily.

After which decided benefit follows the use of one of the following:

℞. Acidi borici,	gr. xxx	2.	Gm.	
Bismuth. subnit.,	℥ij	8.	Gm.	
Morphinæ hydrochlor.,	gr. j	.065	Gm.	M.

Or—

℞. Pulv. sanguinariæ,	℥j	4.	Gm.	
Acid. tannici,	gr. v	.3	Gm.	
Pulv. camphoræ,	℥j	4.	Gm.	
Bismuth. subnit.,	℥ij	8.	Gm.	M.

Sig.—To be used by *insufflation* or as a *snuff* every three or four hours.

Or—

℞. Ammonii chloridi,	℥j	4.	Gm.	
Glycerini,	f℥ij	8.	Cc.	
Ext. pinus canad. fld.,	f℥j	30.	Cc.	
Aquæ destil.,	ad f℥ij	ad 60.	Cc.	

Sig.—Five or ten drops, dropped into each nostril two or three times a day, or applied with a camel's-hair brush.

Or the following pleasant mixture may be applied to each nostril:

℞.	Tinct. benzoin., ...	℥iv	15. Cc.
	Tinct. guaiaci, ...	℥j	4. Cc.
	Chloroformi, ...	♏x	.6 Cc.
	Tinct. myrrh., ...	℥ss	2. Cc.
	Ol. amygd., ...	♏v	.3 Cc. M.

Sig.—A few drops in each nostril once, or oftener, a day.

DISEASES OF THE PHARYNX.

ACUTE CATARRHAL PHARYNGITIS.

Synonyms. Catarrhal tonsillitis; angina catarrhalis; acute "sore throat."

Definition. An acute catarrhal inflammation of the mucous membrane of the tonsils, uvula, soft palate, and pharynx; characterized by rigors, fever, painful deglutition, coughing, or constant desire to clear the throat, with a more or less decided nasal intonation of the voice.

Causes. Exposure to cold and damp; swallowing hot fluids or food; during the prevalence of scarlatina, measles, erysipelas, influenza, diphtheria, or variola. It is attributed to some form of bacteria by numerous observers.

Pathological Anatomy. The mucous membrane and submucous tissues of the uvula, soft palate, fauces, tonsils, and pharynx are congested, red, and swollen; the secretion is at first lessened or entirely arrested, later it is increased, but of a thick, tenacious, opaque character. The swelling is most evident at the uvula, due to the amount of relaxed submucous tissue, which is especially thick and long, often resting on the root of the tongue ("the palate is down"). Frequently one or both tonsils are swollen to such an extent that the fauces are completely occluded, and the condition is mistaken for the graver phlegmonous tonsillitis.

In severe attacks of catarrhal angina, white or grayish-white membranous masses form in small, irregular, roundish spots on the red-

dened mucous membrane of the tonsils, soft palate, and pharynx, causing the affection to be frequently mistaken for diphtheria.

Symptoms. The onset is usually sudden, with *rigors*, *fever*, thirst, headache, loss of appetite, coated tongue, bad taste, foul breath, *dryness in the throat*, *painful deglutition*, *and constant desire to clear the throat*, due to the increased length of the uvula; as the inflammation proceeds the *secretions* are increased, the fluid often filling the mouth, causing a constant desire to swallow, each act being associated with acute pain. Not infrequently *earache* adds to the patient's distress, from extension of the "catarrh" to the Eustachian tubes and tympanum.

In severe attacks of catarrhal pharyngitis, cases which, from the intense hyperæmia, have been termed *erysipelatous* or *erythematous pharyngitis*, the muscles of the palate are infiltrated with serum, which greatly interferes with their function. Under normal conditions the contraction of the muscles of the anterior half arches of the palate prevents the return of food and drink into the mouth; while the contraction of the muscles of the posterior half arches, together with the uvula, closes the passage to the nose; if the function of these muscles be impaired, fluids would be driven through the nose or back into the mouth by the contractions of the pharynx in the act of deglutition.

In all affections of the pharynx a *nasal* tone is pathognomonic, especially if the muscles of the half arches are interfered with.

Varieties. *Exanthematous pharyngitis* is the form of the affection complicating the acute infectious diseases, such as scarlatina, measles, influenza, and small-pox.

Erysipelatous pharyngitis is the form complicating facial erysipelas; rarely, however, the affection begins in the pharynx, spreading to the face and other parts. The association of nasal inflammation with erysipelas should not be forgotten.

Gangrenous pharyngitis may occur with diphtheria, scarlatina, erysipelas, small-pox, and typhoid fever. The symptoms assume a typhoid (depressed) character, the termination being usually fatal.

Phlegmonous pharyngitis is the variety associated with an accumulation of pus in the submucous and deeper tissues of the pharynx, constituting a *retro-pharyngeal abscess*. This variety of pharyngitis may follow the penetration of a sharp piece of bone or be secondary to caries of the cervical vertebræ.

Fibrinous pharyngitis, or, as it is sometimes termed, *pseudo-mem-*

branous, is considered with croup and diphtheria, of which it is a variety.

Diagnosis. On account of the great swelling of the tonsils, it may be mistaken for *acute tonsillitis;* but the mild inflammatory symptoms should prevent the error.

Cases with membranous deposits upon the tonsils, soft palate, and pharynx, are no doubt often misnamed *diphtheria:* the marked difference in the constitutional symptoms and the absence of the Klebs-Loeffler bacillus should prevent the error.

Prognosis. Favorable, the affection terminating in three or four days by the discharge of a quantity of thick, opaque mucus.

Treatment. If the attack is the result of exposure to cold or damp, or a symptom of some one of the infectious diseases, the very best results follow the application of *sodii bicarbonas* by insufflation. *Opium* in some form, alone or combined with *ipecac* or *camphora*, will often abort an attack of catarrh. *Salol*, gr. iij (0.2 Gm.), and *phenacetin*, gr. iij (0.2 Gm.) combined with *pulv. camphoræ*, gr. j (0.065 Gm.) (reducing size of dose for children,), repeated four to six times daily, are most valuable remedies for relieving the pain in all varieties of acute anginas. *Sodii salicylas*, gr. x–xv (0.6–1 Gm.) hourly until five or six doses are taken, often acts like a specific. If the fever be marked, advantage follows the addition of small doses of *tinctura aconiti*. In children no one drug can compare with small repeated doses of tinctura aconiti. Excellent results often follow the use of *nuclein* (Aulde), gr. j–iij (0.065–0.2 Gm.), or ♏j–v (0.065–0.3 Cc.) every hour or two.

Locally, *cocaine* painted over the inflamed parts, of the strength of a four per centum solution, or used in the form of lozenges, is a valuable remedy. Holding small pellets of ice in the mouth is useful, or the application of either heat or cold to the angles of the jaws. *Gargles* or *sprays* of *aluminis* [gr. viij (0.52 Gm.); aquæ, ʃʒj (30 Cc.)]; *ammonii chloridum* [gr. xx (1.3 Gm.); aquæ ʃʒj (4 Cc.)]; or *potassii chloras* [gr. x (0.6 Gm.); aquæ ʃʒj (30 Cc.)], used at frequent intervals, often allay the congestion and consequent swelling. For the gangrenous variety stimulants and the local use of *argenti nitras*.

If a retro-pharyngeal abscess develop, evacuate the pus early and give *quininæ sulphas* and *ferrum* for the constitutional symptoms which may develop.

ACUTE TONSILLITIS.

Synonyms. Amygdalitis; quinsy; phlegmonous pharyngitis.

Definition. An acute parenchymatous inflammation of one or both tonsils, with a strong tendency toward suppuration; characterized by moderate fever, pain in the throat, a constant desire to relieve the throat, painful and difficult deglutition, impeded respiration, and more or less muffling of the voice.

Causes. Generally attributed to exposure to cold, but, in the majority of instances, the exposure is so slight that there must be a predisposition to the affection, for persons once affected are particularly prone to repeated attacks upon the slightest exposure.

Pathological Anatomy. One or both tonsils will be seen, on inspection, to project from its bed, as a rounded, deep red body, which may even extend beyond the median line, when they may entirely occlude the isthmus of the fauces; the half arches and posterior border of the soft palate are reddened and somewhat swollen. The surface of the tonsils is often covered with small, yellowish points, which closely resemble patches of false membrane, but careful inspection will show that they are beneath the mucous membrane, being only the distended follicles of the gland. The mucous membrane of the fauces and pharynx is more or less red and swollen.

Symptoms. Onset more or less sudden, with *rigors*, *rise in temperature*, 102° to 104° F.; *full, frequent pulse*, 100 to 120; *headache*, *thirst*, *pain and swelling at the angle of the jaw* with a constant desire to clear the throat; *difficult and painful deglutition*, from the enlarged tonsils almost closing the fauces, when the *respiration* is more or less *impeded;* the *voice* is more or less *muffled*, and attempts at phonation increase the pain.

Darting pains along the Eustachian tubes are of frequent occurrence, the patient complaining of *earache* and more or less *deafness*.

If *suppuration* be imminent, the throat becomes more *painful*, the character of the pain *throbbing*, the febrile phenomena increase, with more or less *depression*, the symptoms seeming to be of great danger, when suddenly, after an effort at vomiting, or spontaneously, the tonsillar abscess bursts, a quantity of pus escapes from the mouth, and prompt relief follows.

Duration. The disease lasts from three to seven days, terminat-

ing either by suppuration or the gradual resolution of the enlarged glands.

Diagnosis. Tonsillitis can hardly be mistaken for any other affection if the fauces are inspected.

Prognosis. In the majority of cases the result is favorable, it very rarely proving fatal, except in children, and only then by obstructing the respiration, and, at the same time, so seriously interfering with nutrition that the child's strength fails.

Treatment. The first indication in an attack of acute tonsillitis is a prompt and efficient purgative, and none is better than calomel:

℞. Hydrarg. chlor. mitis, ... gr. v .3 Gm.
Sodii bicarbonatis, ... gr. v .3 Gm. M.
Ft. chart.

Followed in six or eight hours by a saline. I can confidently recommend *sodii salicylas*, gr. x–xv (0.6–1 Gm.), every hour or two until a drachm and a half to two drachms are administered. It should be well diluted. *Cinchonidinæ salicylas*, gr. v (0.3 Gm.), every couple hours is often beneficial.

Should the febrile action be high, *tinctura aconiti* in small doses frequently repeated, either alone or alternating with *sodii salicylas*, rapidly reduces the temperature and the frequency of the pulse, and, by its local action, lessens the pain and swelling. If from any cause the internal use of *aconitum* be contra-indicated, the *tinctura aconiti* may be diluted with *glycerinum* and painted over the affected parts.

Cases not seen until two or three days after the onset are benefited by the following:

℞. Tincturæ ferri chloridi, ... f℥ij 8. Cc.
Glycerini, ... ad f℥ij ad 60. Cc. M.
Sig.—Teaspoonful every two hours, *undiluted*.

This palatable mixture, suggested by Dr. Bosworth, acts as a local astringent in passing over the inflamed tonsils, and should not be followed with water or food for an hour at least.

During the past five years I have had excellent results from *nuclein* (Aulde), gr. j–iij (0.065–0.2 Gm.), or ♏j–v (0.065–0.3 Cc.), every hour, the patient sucking pellets of ice, and having hot dry applications to the angles of the jaw.

Scarification, a long, sharp bistoury being used to make five or six

cuts, affords great relief when the tonsils are much inflamed; the *external* use of *ice* over the site of the glands, and small pellets allowed to dissolve in the mouth, afford great relief. If the application of cold be objectionable, heat may be substituted in the form of warm compresses or poultices.

In all cases recourse to such general therapeutic measures as are calculated to guide the morbid action to a favorable issue; the bowels should be kept open and the skin and kidneys active; the *diet* should be in the shape of gruels, as it is impossible for the patient to swallow any solid substance, and in cases where even gruels cause painful deglutition, thin oatmeal gruel can be used with advantage.

When *suppuration* cannot be averted, hot applications should be applied to the angles of the jaws, hot gargles and the steam atomizer resorted to, medicated with opium, belladonna, benzoin, or cocainæ hydrochloras, and as soon as fluctuation can be detected the abscess should be opened. Also during this stage administer *quininæ sulphas*, gr. iij–v (0.2–0.3 Gm.) every three or four hours. After the acute symptoms have subsided, assist the return of the glands to their normal condition by the topical application of *cupri sulphas* [gr. xx (1.3 Gm.) aquæ f℥j (30 Cc.)], or *liquor ferri subsulphatis* [f℥j (4 Cc.) aquæ f℥j (30 Cc.)].

DISEASES OF THE LARYNX.

ACUTE CATARRHAL LARYNGITIS.

Synonyms. Catarrhal laryngitis; "sore throat."

Definition. An acute catarrhal inflammation of the mucous membrane of the larynx; characterized by feverishness, diminished or suppressed voice, painful deglutition, and more or less difficulty of respiration.

Causes. Atmospherical changes; cold draughts of air, either directly inspired or an exposure of parts or all of the body. Cold,

wet feet. Inhalation of irritating vapors, such as gases, smoke, or ammonia, or the inhalation of dust. Prolonged efforts at public speaking or singing or the same efforts under difficulties. In children, from violent fits of crying.

Pathological Anatomy. In mild cases there is a transient *congestion* (hyperæmia) of the mucous membrane over the entire, but more commonly circumscribed portions of, the larynx, with more or less swelling and diminished secretion; the mucous membrane soon returns to its normal condition, the secretion being slightly increased.

Symptoms. The attack begins rather suddenly with a feeling of *dryness*, *rawness*, and *tickling*, referred to the larynx with the sensation of the presence of a foreign body in the throat, and with *hoarseness* and a disposition to cough. Deglutition causes pain by the upward movement of the larynx and by the pressure of the food on the larynx as it passes along the gullet. Attempts at speaking are attended with more or less distress and the larynx is tender on pressure.

Coughing, from the onset, of a *noisy*, *harsh*, *hoarse*, or *toneless* character and the act of coughing attended with a sensation of scratching in the larynx. The first day or two there is scanty expectoration, but in a short time the secretion is increased, giving the cough a loose character. In the early stages the sputa may be slightly streaked with blood. Rarely a hemorrhage occurs from the mucous membrane of the larynx. The *voice* is at first decidedly *hoarse*, soon followed by complete *aphonia*. The *respiration* is but slightly, if at all, affected in adults. There may be more or less febrile reaction. In *children* the onset is with *fever*, white *coated tongue*, *frequent*, *tense pulse*, *hot skin* and *flushed face*, embarrassed respiration, the voice *hoarse* and *whispering*, with *harsh*, *ringing*, *croupy cough* and great restlessness. During the night the child is subject to suffocative attacks (laryngismus stridulus).

Laryngoscopic appearances. These vary with the severity of the attack and the stage of the inspection. In *mild cases*, at an early period, the mucous membrane presents a bright red appearance. *Severe cases* present, in addition to the bright redness, swelling of the mucous membrane to such an extent at times as to conceal the vocal cords, they appearing only as slender threads of a reddish tint. At times the mucous membrane presents the appearance of erosions or ulcerations, due to the desquamation of the epithelium.

Duration. Usually about one week; if very severe, two or three weeks may elapse before the larynx returns to its former condition.

Prognosis. Simple catarrhal laryngitis never terminates fatally.

Treatment. Confinement to an apartment of uniform temperature, the air kept moist by the vapor of water, particularly for children.

Locally, a hot pack should be kept constantly wrapped about the throat, and if its application is preceded by the temporary use of a weak mustard plaster, the relief afforded is more rapidly obtained. At the very beginning of an attack the feet should be placed in a hot mustard foot bath, and either a *saline cathartic* or *mercurial purgative* administered.

Prompt action on the skin at the very onset will frequently shorten the duration of a catarrh of the larynx. Use for this purpose in adults *pulvis ipecacuanhæ et opii*, gr. iij (0.2 Gm.), combined with *potassii nitras*, gr. iij (0.2 Gm.), every three or four hours. If there be much febrile reaction, benefit follows the use of *tinctura aconiti*, ♏j–ij (0.06–0.12 Cc.), every half hour until five or six doses are taken, after which every hour or two, combined with *tinctura opii*, ♏j–v (0.06–0.3 Cc.); or diaphoresis may be produced by *antimonii et potassii tartras*, gr. $\frac{1}{20}$–$\frac{1}{30}$ (0.003–0.002 Gm.), every hour, or by the hypodermic injection of *pilocarpinæ hydrochloras*, gr. ⅓ (0.022 Gm.).

For children, several doses of the following powder a couple of hours apart, until the bowels are freely moved:

℞. Hydrargyri chloridi mitis, ... gr. ⅛ .008 Gm.
Pulvis ipecacuanhæ, ... gr. ⅛ .008 Gm.
Sacch. lactis, ... gr. ij .13 Gm.

To be followed by—

℞. Potassii citrat., ... ℈iv 5.3 Gm.
Tinct. aconiti, ... ♏v .3 Cc.
Tinct. opii camphorat., ... f℥ij–iv 8.–15. Cc.
Syr. scillæ, ... f℥ij 8. Cc.
Syr. tolu, ... ad f℥iij ad 90. Cc. M.

Sig.—One teaspoonful every two hours.

If a tendency to spasm of the glottis obtains, full doses of the *bromides* should be administered at once.

Inhalations from the onset are not only soothing, but curative, in their actions. Either of the following are recommended:

℞. Infusi humuli, ... Oj 475. Cc.
Vinegar, ... f℥ss–j 15.–30. Cc.
SIG.—Inhale hot every hour.

℞. Tinct. benzoin. comp., ... f℥j–ij 4.–8. Cc.
Aquæ bullæ, ... Oj 475. Cc.
SIG.—Inhale hourly.

The local application of cocaine is of great benefit.

Attacks of acute laryngitis occurring from efforts in public speaking or singing are wonderfully benefited by the use of *acidum nitricum dilutum*, ♏ij–v (0.12–0.3 Cc.), every hour or two; or *atropinæ sulph.*, gr. $\frac{1}{300}$ (0.00022 Gm.), repeated in an hour for several doses.

The patient should abstain altogether from the use of the voice and from taking food or drink of an irritating character.

ŒDEMATOUS LARYNGITIS.

Synonym. Œdema of the glottis.

Definition. An acute inflammation of the mucous membrane of the larynx and that about the glottis, with an infiltration of the areolar tissues by a serous, sero-purulent, or purulent fluid; characterized by obstructed or stridulous breathing and dysphonia or aphonia.

Causes. The result of acute laryngitis; abscess in or about the throat or tonsils; erysipelas of the face; scarlatina; small-pox; Bright's disease; syphilis of the larynx. Rare in children.

Pathological Anatomy. Infiltration into the loose connective tissue of the ary-epiglottic folds, the glosso-epiglottic ligament, the base of the epiglottis, and the inter-arytenoid space. If the true vocal cords are inflamed, their color changes, and instead of appearing white, glistening, and brilliant, they are dull, grayish-red, or violet-red in patches. If the swelling be the result of purulent infiltration, the parts present a deeply congested color, with here and there spots of a yellowish hue.

Serous infiltration, sufficient to cause fatal œdema, disappears with death, leaving but slight traces to account for the formidable symptoms.

Symptoms. The onset is much the same as a simple catarrhal laryngitis with a gradually *increasing impediment to the respiration.* The patient experiences the sensation of a foreign body in the throat, and after a short time a *difficulty of breathing*, which ultimately threatens *suffocation.* The *deglutition* is rendered difficult owing to the swelling of the epiglottis; the *voice*, at first muffled, gradually becomes weaker and weaker, until finally it is almost extinct; the *cough* at first is dry and harsh, but as the infiltration increases it becomes stridulous and suppressed; there is no expectoration, except that after great effort to clear the throat a little frothy mucus is raised. The *difficulty of respiration*, as the disease progresses, becomes greater and greater, and the *paroxysms of impending suffocation* more frequent. The inspiration is accompanied by a whistling sound characteristic of the narrow condition of the glottis; the patient sits up in bed, his mouth open, gasping for breath, his eyes protruding, the whole body trembling with intense convulsive movements, and after a time a general cyanosis commences, the face assuming a bluish hue, all these symptoms continuing for a few moments, when slight relief occurs, to be again followed by another paroxysm, in one of which, if nature or art does not afford prompt relief, death occurs from asphyxia.

A physical examination of the parts may be made by gently passing the finger into the throat, when the epiglottis may be felt very much thickened, and the ary-epiglottic folds may have attained such tumefaction as to convey to the finger an impression similar to that which is given by touching the tonsils.

Laryngoscopic appearance. The mucous membrane has a bright red appearance. The epiglottis has the appearance of a semi-transparent roll-like body, or it is often merely erect and tense. It is this condition of the epiglottis which explains the pain and difficulty in deglutition. Rarely the vocal cords are infiltrated.

Diagnosis. Any disease which gives rise to dyspnœa may simulate œdematous laryngitis, but the history of the case, together with a laryngoscopic examination, will generally furnish conclusive evidence of the nature of the malady.

Prognosis. As a rule, unfavorable. If early and vigorous treatment be instituted, recovery is possible, but without it death is the inevitable result, the patient dying asphyxiated. Even when local measures have removed the obstruction to free respiration, the patient

is very likely to perish subsequently from exhaustion or blood poisoning, or from pneumonia or other lung complication. The duration of infiltration of the larynx varies from a few hours to several days.

Treatment. Prompt local treatment must be adopted in order to remove the laryngeal obstruction. *Leeches* placed over the sides of the larynx in mild cases may effect reduction in the œdema, rendering the subsequent progress free from danger.

If the *infiltration* has already occurred and is slight in amount, *scarification*, guiding the instrument by the index finger of the opposite hand, may afford relief, or the hypodermic injection of *pilocarpinæ hydrochloras*, gr. ⅓ (0.022 Gm.), repeated, may lessen the swelling.

Niemeyer recommends the *persistent* use of small pellets of ice early in the attack, swallowed or held far back in the mouth until dissolved. Trousseau recommends the *inhalation* or *spray* of a strong solution of *acidum tannicum*. Prof. Da Costa suggests the application, as near the seat of the disease as possible, of *liquor ferri subsulphatis* (Monsel's solution), full or half strength. Mackenzie says the patient should be kept constantly under the influence of *potassii bromidum*.

If these means fail, *tracheotomy* is indicated; in those cases of sudden and rapid infiltration of the glottis or larynx occurring in Bright's disease, erysipelas, scarlatina, or syphilis of the larynx, and especially the former and the latter, *tracheotomy should be performed at once*. *Intubation* relieves the obstructed breathing while other means are combating the disease.

In all cases of infiltration of the larynx stimulants should be boldly administered per rectum, if stomachic administration be impossible.

If the infiltration be composed of *pus*, *quininæ sulphas*, gr. v (0.3 Gm.) every four hours, and stimulants are indicated.

SPASMODIC LARYNGITIS.

Synonyms. Spasmodic croup; false croup; catarrhal croup; child crowing.

Definition. A catarrhal inflammation of the mucous membrane of the larynx, associated with *temporary spasmodic contraction* of the glottis; characterized by paroxysmal coughing, difficulty of breathing, and attacks of threatening suffocation.

Causes. Atmospherical changes or "taking cold"; excesses in eating and drinking; excitement; violent emotion, are all given as causes for simple croup.

Pathological Anatomy. *Congestion* of the mucous membrane of the larynx, with slight swelling and deficient secretion, are the only changes that have thus far been noted.

Symptoms. The attack occurs chiefly during the *night*, the child on retiring having either its usual health, or perhaps being a little feverish. After several hours of sleep the child is *suddenly awakened* by a *paroxysm of suffocation*, and a *dry, harsh, ringing cough*. After half an hour or an hour or two the breathing becomes easier, the cough less "croupy," the skin is covered with more or less perspiration, and the child falls asleep. The next day there is present cough of a loose character, the respiration being about normal. If no treatment be instituted, the same phenomena occur on the second night, the child being apparently well during the second day, the cough being less in amount; phenomena of a similar character, but of much less severity, are present the third night, after which the disease usually disappears.

If the symptoms of the first paroxysm continue pronounced for two or three days, there is a strong probability that the inflammation may become fibrinous in character, or that true croup may develop.

Diagnosis. The symptoms are so characteristic that it seems impossible for the affection to be mistaken for any other disease.

Prognosis. Spasmodic or simple croup always terminates favorably.

Treatment. During the paroxysm, the child should at once be placed in a *hot bath* and *hot or cold compresses* wrapped about the *throat*. These means should be preceded or followed by a mild *emetic*. The late Chas. D. Meigs always used *aluminis*, with or without *syrupus ipecacuanhæ;* Prof. Bartholow recommends *hydrargyri subsulphas flavus* (turpeth mineral) gr. j–iij (0.065–0.2 Gm.); Prof. Da Costa suggests the cautious use of *apomorphinæ hydrochloras*, gr. $\frac{1}{10}$ (0.006 Gm.), hypodermically. A favorite remedy for emesis, in Germany, when the jaws are not closed, and one that is highly successful, is tickling the fauces with the finger or a feather until vomiting is produced. Inhalations of *chloroformum* often at once relieve the spasms, but must never be employed by non-professional persons. Having by any of the above means broken up the spasm

of the larynx, a prompt cathartic should be administered (℞. Hydrargyri chloridi mitis, gr. ij (0.13 Gm.), sodii bicarbonatis, gr. iij (0.2 Gm)., M. et ft. chart. no. j), followed in six to eight hours, if not sufficient results, with *oleum ricini*, after which:

℞.	Tincturæ aconiti, ...	♏viij	.5	Cc.	
	Syr. ipecacuanhæ, ...	f℥iss	6.	Cc.	
	Tincturæ opii camphorat., . . .	f℥iij	12.	Cc.	
	Liquor potassii citratis, . . .	ad f℥iij	ad 90.	Cc.	M.

Sig.—One teaspoonful every hour or two.

CROUPOUS LARYNGITIS.

Synonyms. Membranous croup; true croup.

Definition. An acute inflammation of the mucous membrane of the larynx, attended with the exudation of a tough secretion—the *false membrane*—and the occurrence of *spasm of the glottis;* characterized by febrile reaction, frequent ringing cough, dyspnœa, with loud respiratory sound, and altered or extinct voice, showing a strong tendency toward death by asphyxia.

Causes. A disease of childhood, most common in strong, vigorous, well-nourished males. Certain families present a strong hereditary tendency. Most common during a humid winter.

We cannot assent to the dictum of some authorities, that laryngeal diphtheria and croupous laryngitis are identical.

Pathological Anatomy. Intense *hyperæmia* of the mucous membrane of the larynx, associated with *swelling*, *œdema*, and marked *redness*. There soon appears on the surface of the mucous membrane a grayish pellicle, rapidly coalescing and becoming thicker,—the *opaque, false membrane*,—which differs in extent, thickness, and adhesiveness in different portions of the larynx. In all cases the false membrane is found on the vocal cords and inner surface of the epiglottis. The first *exudation* (membrane) softens by the serum which is exuded, and is then mechanically dislodged by acts of coughing or vomiting, but is followed by successive deposits upon the mucous membrane.

When the false membrane is detached, the mucous membrane of the larynx is found unaffected, so far as the loss of structure is concerned. Several successive crops of membrane may form after the

detachment, or it may entirely cease to form after the removal of the first exudation.

On *microscopical examination* the false membrane is found to be composed of a fine network of fibrillæ, holding in their interstices leucocytes of an albuminous or fibrinous nature.

The false membrane may extend into the pharynx, but especially is it liable to extend into the trachea and bronchial tubes, and, as the inflammation extends downward, the character of the exudation changes from fibrinous to muco-purulent.

Symptoms. The onset of "true croup" is either suddenly, by an attack of spasmodic croup, or gradually, as an acute catarrh of the larynx, rapidly increasing in severity, with a feeling of *heat* in the throat, *huskiness* of the voice, *harsh cough*, *fever*, and *thirst*, the hoarseness soon becoming marked, and the *cough* having a *metallic*, "*croupy*" character, rapidly *changing* to a *stridulous*, *husky* sound; every few minutes the child takes a sudden, deep, *stridulous inspiration*, the voice becoming more and more husky. *Difficulty of breathing* now follows; the child is unable to lie down, or if exhausted by the efforts at inspiration, it is quiet for a moment, it soon starts up in fright, breathing more heavily, with a *shrill*, *whistling inspiration*. Soon, from the narrowing of the glottis, from the presence of the membrane, the expiration becomes difficult and noisy, and *suffocation* seems imminent from the *paroxysmal* attacks of *spasm of the glottis;* the child tosses wildly about, tears at its throat, as if to remove some obstacle, the face becoming *cyanosed*, the alæ of the nose working rapidly, the mouth wide open, the inspiratory efforts gasping, the body covered with a profuse sweat, and death seems imminent, when, suddenly, the spasm is relaxed, air enters the chest, the breathing becomes somewhat easier, and the child, exhausted and partially stupefied, drops into a fitful sleep of a few moments' duration.

The *suffocative attacks* return at short intervals, or there occur decided remissions between them, considerable portions of the false membrane being expelled, allowing the child to fall into a refreshing sleep.

In those cases which tend to a favorable termination, the appearance of improvement noted between the suffocative attacks is maintained, the paroxysms of suffocation becoming less frequent, the expectoration of membrane more marked, the difficulty of breathing lessens, the cough loosening, the voice gradually returning, the

fever, which has been more or less high during the attack, disappearing.

If, instead of improvement, the case tends toward a fatal termination, the suffocative attacks become more frequent, expectoration is absent, the voice and cough inaudible, although the efforts at speaking and coughing are visible, the difficulty of breathing continues, the respirations becoming more frequent and shallow, but without whistling and stridor, the *cyanosis* deepens, the countenance has an indifferent, drowsy, and stupid look, the eyes dull and nearly closed, with symptoms of depression, the pulse rapid and weak, the surface covered with a cold, clammy sweat, the extremities cold, stupor and insensibility more marked, the child dying of carbonic acid poisoning or *asphyxia*.

Duration. The duration of true croup is about one week, rarely continuing ten days.

Diagnosis. *Œdema of the glottis* might be mistaken for croup until the period of the formation of the characteristic membrane. The chief points of distinction from the onset are, however, absence of fever, paroxysmal attacks of difficult respiration, followed by a complete return to the normal condition. Œdema of the glottis is rare in childhood.

The following are the chief points of difference between croup and laryngeal diphtheria:

Croup.	Diphtheria.
A local disease.	A constitutional disease.
Begins in trachea and extends up.	Begins at tonsils and extends down.
Exudation never cutaneous.	Exudation often cutaneous.
No pain in swallowing.	Often severe pain in swallowing.
No swelling of submaxillary and lymphatic glands.	Swelling of submaxillary and lymphatic glands.
Cough always present and often reduced to a mere whistle with peculiar metallic ring.	Seldom much cough and then only hoarse.
Not traceable to bad drainage.	Often traceable to bad drainage.
Seldom occurs in adults.	Often occurs in adults.
Neither contagious nor infectious.	Both contagious and infectious, both before and after death.
A sthenic disease.	An asthenic disease.

Croup.	Diphtheria.
Membrane does not extend to nares.	Often extends to nares and many other parts.
No symptoms of septicæmia.	Septicæmia generally present.
No albuminuria.	Albuminuria frequent.
Neither attended with nor followed by paralysis.	Paralysis not uncommon.
Death seldom caused by syncope.	Death from syncope common.
Death due to suffocation.	Death frequently results from other causes.
Absence of a specific germ.	Presence of the Klebs-Loeffler bacillus.

Prognosis. A very fatal disease. The danger increases in proportion to the age and feebleness of the child. *Intubation* has wonderfully lessened the mortality in croup.

Unfavorable symptoms are: Loud, stridulous, inspiratory, and expiratory sounds, laborious and prolonged expiration, depression of the base of the thorax during inspiration, whispering voice or complete aphonia, congestion of the face and neck, stupor, weak, rapid, and irregular pulse, cold extremities, and a cold, clammy perspiration.

Favorable symptoms are: Expectoration of false membrane, decrease of the stridulous respiration, voice changing from whispering to hoarseness, looseness of the cough, moderation of the fever, and an improvement in the general condition.

Treatment. The *indications* for treatment are to *detach* and *remove the false membrane*, to *prevent its reformation*, to *prevent the attacks of spasm of the glottis*, and to *maintain the strength.*

To detach and remove the membrane *emetics* are of the highest utility, the favorite of this class being the one first used in this disease by Dr. Fordyce Barker, consisting of *hydrargyri subsulphas flavus* (turpeth mineral), gr. ij (0.13 Gm.) for a child of two years of age, repeating the dose as often as rendered necessary by the obstructed breathing; but the unnecessary administration of emetics should be avoided, as the strength of the patient must be maintained.

To prevent the formation of the *membranous exudation* a number of remedies have been recommended and highly lauded, but *hydrargyrum* is the only one that has stood the test of experience; it may be used as *hydrargyri chloridum corrosivum*, gr. $\frac{1}{48}$–$\frac{1}{20}$ (0.0015–0.003 Gm.) every two or three hours, or in the following formula:

℞. Hydrargyri chloridi mitis, . . . gr. ⅛–¼–½ .008–.016–.032 Gm.
Sodii bicarbonatis, ... gr. ij. .13 Gm.
Pulvis ipecacuanhæ, ... gr. $\frac{1}{12}$–$\frac{1}{6}$ .005–.011 Gm. M.
SIG.—One powder every two hours.

Prof. Da Costa has suggested either of the following combinations:

℞. Antimonii sulphurati, ... gr. ⅛ .008 Gm.
Pulv. ipecacuanhæ et opii, . . . gr. ½ .032 Gm. M.
SIG.—In powder every two hours.

Or—

℞. Hydrargyri chloridi mitis, . . . gr. ⅛ .008 Gm.
Pulvis ipecacuanhæ et opii, . . . gr. ½ .032 Gm. M.
SIG.—In powder every two hours.

Antimonii et potassii tartras, a remedy that some years ago was popular in large doses, is again brought forward in doses of gr. $\frac{1}{30}$–$\frac{1}{20}$ (0.002–0.003 Gm.). *Quininæ sulphas*, gr. v. (0.3 Gm.) every three hours until six doses have been taken, if given before the exudation has formed, it is claimed will prevent its formation. It can be used by suppository.

To prevent the paroxysms of spasm, small doses of *opium* in the form of *pulvis ipecacuanhæ et opii* (Dover's powder), or full doses of the *bromides*, preference being given to *ammonii bromidum*, as suggested by Prof. Bartholow, on account of its being "eliminated by the bronchial and faucial mucous membrane, thus acting locally."

To maintain the strength of the patient, *alcoholic stimulants* in full doses, nutritious but easily digested *aliment*, *strychninæ sulphas* in tonic doses, and *ammonii carbonas*, are particularly indicated.

As soon as emesis has subsided, *intubation* should be practised.

Locally, the use of all caustic or irritating applications to the fauces or larynx is emphatically contraindicated.

The *inhalation* of the vapor of slaked, freshly burned lime is one of the most ready and efficient means for assisting in the detachment of the false membrane. The application of *cold or hot compresses*, according to the feelings of the patient, around the throat, have a strong tendency to prevent the recurrence of the spasms. After the formation of the membrane, great relief follows the use of the vapor inhalations and of oxygen gas, which, with stimulants and liquid nourishment, may safely carry the patient through the disease. Cases

in which the membrane presents a tendency to slowly loosen itself, if the patient's strength does not contraindicate it, are greatly benefited by the application of *sinapis*, or even small *flying-blisters*, to the larynx. Inhalations of *oxygen* have seemed useful in several cases, as has the internal use of *hydrogen dioxidum*.

Niemeyer advises, in cases showing carbonic acid poisoning from obstruction of respiration due to accumulation of membrane, the pouring from a moderate height of a few gallons of cold water over the head, nape, and back of the child; the shock produced always causes it to revive for a while, and to cough vigorously, thus expectorating large quantities of the membrane, but this procedure will become obsolete in proportion as *intubation* is practised.

If the exudation still continues, regardless of the means employed, the propriety of *tracheotomy* must be determined.

LARYNGISMUS STRIDULUS.

Synonyms. Spasm of the glottis; pseudo-croup; Millar's asthma; thymic asthma: "Kopp's asthma"; tetany.

Definition. A spasm of the muscles of the larynx innervated by the inferior or recurrent laryngeal nerves; characterized by a sudden development of dyspnœa and the appearance of deficient oxygenation of the blood.

MacKenzie describes it as "a form of convulsion occurring in ill-nourished infants, characterized by spasmodic action of the abductors of the vocal cords, and in severe cases by spasm of the diaphragm and intercostal muscles."

Causes. Most common in children, the result of teething, laryngitis, indigestion, scrofula, or other cachexiæ. Attacks in adults are not uncommon. It is often hereditary.

Pathological Anatomy. Death the result of spasm of the glottis is such a very rare occurrence that the changes in the larynx are not determined.

The mechanism consists in an irritation of the superior laryngeal nerve,—the afferent nerve,—whose function is to supply the mucous lining of the larynx with sensibility, whence is reflected through the inferior laryngeal nerve—the efferent nerve—the motor influence resulting in the spasm of the laryngeal muscles.

Symptoms. The spasm of the laryngeal muscles is of sudden onset, and usually after nightfall. The child may have been in perfect health, to all appearances, on retiring, or it may have shown symptoms of catarrh of the upper air passages, or been suffering from gastro-intestinal or dental irritation.

The child awakes suddenly, *coughing* in a metallic, resonant tone—the *croupy cough*—and with great *dyspnœa*, with *loud*, *crowing*, *stridulous inspirations*, the result of narrowing of the larynx from spasm, with *wheezy*, *stridulous expirations*.

The entrance of air is so greatly obstructed that all the accessory muscles of respiration are called into use; the lips and finger nails become blue, the surface cold, the countenance anxious, and the inferior portion of the chest is drawn in, instead of being expanded, during inspiration. General *convulsions* occur at times, during a paroxysm, also *strabismus*, and involuntary discharge of the fæces and the urine.

The paroxysm continues from half an hour to an hour or more, to return after a few hours' sleep or during the following night; the cough, during the day, having the croupy character.

Diagnosis. The non-febrile and distinctly intermittent nature of the affection differentiates it from croup, and its own distinctive characters from all other diseases. The view is gaining that it is a variety of tetany.

Prognosis. Favorable. Death from suffocation during the paroxysm may occur in very young children, but it is certainly a very rare termination.

Treatment. For the *paroxysm*, the inhalation of a few drops of *chloroformum* is the most prompt method, care being exercised, as complete anæsthesia is unnecessary. Success is reported from the prompt inhalation of *amyl nitris*, also from *nitro-glycerinum*, in small but frequently repeated doses. The following combination is a prompt antispasmodic:

℞. Potassii bromidi, ...	ʒij	8. Gm.
Chloral, ...	gr. xxxij	2. Gm.
Syr. aurantii cort., ...	fʒj	30. Cc.
Aquæ menth., ...	fʒj	30. Cc.

Sig.—One teaspoonful every half hour.

After the paroxysm has been suspended by the above combination, the tendency to a recurrence of the attacks is prevented by the steady

and continued use of *potassii bromidum*, in moderate doses. *Emetics* are often useful in suspending an attack, especially if it be due to indigestion.

Mackenzie advises the use of *musk* during the attack if the child can swallow; and if not, then as soon as the child can take it, and continued at intervals for a day or two. His formula is as follows:

℞. Moschi, ... gr. iss .10 Gm.
Sacch. alb., ... gr. ij .13 Gm.
Pulv. acaciæ, ... gr. ij .13 Gm.
Syr. aurantii flor.,
Aquam, ... āā ad ℥j āā 4. Cc.
Sig.—A dose.

The high price of musk, however, prohibits its general use.

Locally, the *hot*, alternating with the *cold pack*, should be constantly applied to the throat.

The *air* of the room should be *moistened* by the vapor of hot water constantly disengaged in it.

After the attack has passed off, the general condition of the child requires attention; for this purpose it is well to administer a dose of *hydrargyri chloridum mite*, to be followed by a dose of *oleum ricini* or *magnesii carbonas*. The diet must be regulated, all farinaceous articles being absolutely forbidden.

TUBERCULOUS LARYNGITIS.

Synonyms. Laryngeal phthisis; throat consumption.

Definition. An inflammation, tending to ulceration, of the tissues of the larynx, of tuberculous origin; characterized by pain on deglutition, cough, weakness of voice, and progressive emaciation, associated with hectic fever.

Causes. An infection of the larynx with the *bacillus tuberculosis*, either from the inspired air or by the sputum. A depressed state of the system is essential for the action of the bacilli.

Pathological Anatomy. It is well to remember that all chronic inflammations of the larynx associated with pulmonary tuberculosis are not tubercular.

Begins with redness of the mucous membrane, showing scattered tubercles. The tubercles show a strong tendency to cluster, then

soften, leaving shallow, irregular ulcers. The ulcers are covered with a grayish exudate. The mucous tissue round about the ulcers is thickened. The ulcers may, and generally do, erode the true vocal cords, often entirely destroying them. The ulcers slowly extend in all directions, destroying the tissues attacked. The epiglottis may be entirely destroyed.

Symptoms. Usually develops secondary to pulmonary symptoms; rarely it may occur as a primary disease, to be followed with tuberculosis of the lungs. The first symptom is a change in the voice—*huskiness;* this, associated with symptoms of ill health, is always a warning to the physician. The husky voice may proceed until it is but a painful whisper. *Cough* of an irritating, painful character associated with slight expectoration. *Painful* and *difficult deglutition* (dysphagia) is a very constant and distressing symptom. There is the remitting fever so characteristic of tuberculosis, with night sweats, loss of appetite, loss of flesh, and insomnia.

Laryngoscopic examination reveals the characteristic broad, shallow, irregular, grayish ulcers, with the thickened surrounding mucous membrane. The vocal cords show infiltration and thickening or ulceration.

Diagnosis. To discriminate from non-tubercular laryngitis, examine the sputum, and if the specific bacilli are found, the diagnosis is conclusive.

Prognosis. Unfavorable.

Treatment. Remember that tubercular laryngitis is not always preceded by pulmonary phthisis, but in a fair proportion of cases is a primary disease. Much can be done to make the patient comfortable. The application of twenty, forty, or even sixty per centum solution of *acidum lacticum* is a very successful remedy. *Cocainæ hydrochloras* applied directly to the ulcers gives relief to the pain and dysphagia. Local applications of *hydrogen dioxidum*, *argenti nitras*, and *menthol* are of value. Curetting the ulcers and applying *iodoformum* in emulsion or with *morphinæ sulphas* has been practised with benefit.

The general condition must be treated, the diet liquid and of a most nourishing character.

DISEASES OF THE BRONCHIAL TUBES.

ACUTE BRONCHITIS.

Synonyms. Bronchial catarrh; acute bronchial catarrh; "cold on the chest."

Definition. An acute catarrhal inflammation of the bronchial tubes of the larger, middle, and third size; characterized by fever, substernal pain, a feeling of thoracic constriction, oppression in breathing, and at first scanty, followed by more or less profuse, expectoration.

Causes. Most frequent in childhood, especially during the period of dentition, when there exists a strong tendency to catarrh of the mucous membranes in general and of the bronchi in particular. In old age the predisposition again returns. Inhalations of irritants such as dust, smoke, and air too hot or too cold. More common in climates characterized by considerable moisture of the atmosphere, combined with a low temperature, and especially where there are sudden and marked variations. A specific germ?

Pathological Anatomy. *Hyperæmia* of the mucous membrane of the bronchial tubes, manifested by a diffused *redness*, *swelling*, *œdema*, and *diminished secretion*, followed by an *increased secretion* and overgrowth and desquamation of the epithelial cells, together with a copious generation of young cells, the expectoration then becoming of a yellowish color (muco-purulent). As a result of the hyperæmia, rupture of the capillaries of the mucous membrane frequently occurs, when the slight expectoration of the first stage is streaked with blood.

In cases of bronchitis following the exanthemata, or in scrofulous patients, the bronchial glands participate in the inflammation, becoming hyperæmic, swollen, and filled with secretion, and not infrequently the glandular elements undergo a hyperplasia, and finally the "cheesy" degeneration.

Symptoms. The *invasion* is usually characterized by the occurrence of either nasal or laryngeal catarrh, or both, the patient feeling

chilly, followed by *flushes of heat; the limbs, joints*, and even the *body*, are affected with *pain* of an aching, contused character, and with a sense of fatigue and want of energy; there may be a furred tongue, anorexia, and constipation.

In nervous, irritable persons, and in children, there may be slight delirium, and often in very young children, especially during the period of dentition, convulsions may usher in an attack.

After a day or two of these initiatory symptoms, those characteristic of bronchial catarrh develop.

Pain is experienced *beneath the sternum*, especially toward its upper part, of a *raw, burning*, or *tearing* character, *aggravated* by a deep *inspiration* or by *coughing;* the pain also radiates toward the sides, following the course of the primary bronchial tubes. *Tenderness* over the sternum is often experienced. Muscular pain and tenderness of rheumatic character are often associated with attacks of bronchitis.

Cough from the onset, at first in paroxysms of a hard, dry character, changing as the disease progresses, and becoming looser, followed by *free expectoration*. The *expectoration* at first is small in quantity, almost transparent, frothy, and having a salty taste, often streaked with blood. As the disease progresses it becomes more abundant, of a yellowish or a greenish-yellow color, and of a tenacious consistency.

There are present *slight fever*, hot, dry skin, frequent *pulse*, loss of *appetite*, moderate *thirst*, and *constipation*.

A feeling of languor and weariness, and often considerable depression, quite out of proportion to the febrile state, are not infrequent.

Percussion. *Normal*, except in those rare cases in which the bronchial glands are involved, when irregular spots of dullness can be developed.

Auscultation. *First Stage:* The bronchial membrane being swollen and dry, the respiratory murmur is *harsh* or *vesiculo-bronchial* in character, associated with diffused *sonorous* and *sibilant* râles.

Second Stage: The secretion from the bronchial mucous membrane being increased, the respiratory murmur is *less harsh* in character, but is associated with *large and small moist* or *bubbling râles*.

Diagnosis. The points of resemblance and difference between acute bronchitis and other diseases of the chest will be pointed out

when those affections are described. The association of bronchitis with other diseases must not be forgotten.

Prognosis. Acute bronchitis of the larger tubes usually terminates in complete resolution within two weeks. In children and in the aged the course is more protracted, and the symptoms more severe, but recovery is the rule. Very aged and feeble persons may succumb, but it is rare.

Treatment. Depends upon the stage when seen. During the *invasion*, *quininæ sulphas*, gr. x (0.6 Gm.), combined with *morphinæ sulph.*, gr. ⅙ (0.011 Gm.), will usually prevent or abort an attack of acute bronchitis.

In the *first stage*, in adults, when the mucous membrane is swollen and dry, either of the following prescriptions will give prompt relief:

℞.	Antimonii et potassii tart., . . . gr. ij	.13	Gm.	
	Liquor. ammonii acetatis, . . . f℥iv	120.	Cc.	
	Spts. ætheris nitrosi, ... f℥j	30.	Cc.	
	(Tinct. aconiti, if indicated), . . f℥ss	2.	Cc.	
	Syr. simplicis, ... ad f℥vj	ad 180.	Cc.	M.

Sig.—Two teaspoonfuls every two or three hours.

Or—

℞.	Vini ipecacuanhæ, ... f℥j	4.	Cc.	
	Liq. potassii citrat., ... f℥iij	90.	Cc.	
	Liq. ammonii acetat., ... f℥iij	90.	Cc.	M.

Sig.—Tablespoonful every two or three hours.

If the cough of the dry stage be severe, or if the looseness of the bowels follow the use of either of the above combinations, *tinctura opii camphorata* may be added with advantage, or *codeina*, but use opium, with caution, in the dry stage. *Tinctura hyoscyami*, ♏v–xv 0.3–1 Cc.) is much better.

For young children the above, in proportionately reduced doses, or the following:

℞.	Pulv. ipecac. et opii, ... gr. v	.3	Gm.	
	Pulv. scillæ, ... gr. x	.6	Gm.	
	Hydrargyri chlor. mitis, ... gr. ij	.13	Gm.	
	Sacch. lact., ... gr. x	.6	Gm.	M.

Ft. chart. No. x.

Sig.—One every two hours.

The following is an excellent mixture for children:

℞.	Potassii citrat., ...	ʒ ij	8. Gm.
	Syr. ipecac., ...	f ʒ ij	8. Cc.
	Syr. scillæ, ...	f ʒ j	4. Cc.
	Syr. limonis, ...	f ʒ ij	8. Cc.
	Tinct. opii camphorat., ...	f ʒ ij	8. Cc.
	Elix. simplicis, ... ad	f ʒ iij	ad 90. Cc. M.

SIG.—Teaspoonful every couple hours.

Locally: Hot mustard foot bath, and *sinapis* or *terebinthina stupes* over the chest, or, if much substernal pain and sthenic, a few *dry* or even *wet cups*, the patient being confined to an apartment in which the air is moistened by the vapor of hot water.

Second Stage: The secretion of the bronchial mucous membrane being copious, stimulating expectorants are indicated, such as *ammonii chloridum, scilla, ammonii carbonas*, or *potassii carbonas*. A reliable combination is:

℞.	Ammonii chloridi, ...	ʒ ij	8. Gm.
	Scillæ aceti, ...	f ʒ iij	12. Cc.
	Syr. ipecac., ...	f ʒ ij	8. Cc.
	Misturæ glycyrrhizæ comp., . ad	f ʒ iij	ad 90. Cc.

SIG.—Dessertspoonful every three hours.

Attacks showing a tendency to linger are greatly benefited by the following:

℞.	Terebeni, ...	f ʒ ij	8. Cc.
	Creosoti, ...	♏ xxiv	1.5 Cc.
	Mucil. acaciæ, ...	q. s.	q. s.
	Aquæ chloroformi, ... ad	f ʒ iij	ad 90. Cc. M.

SIG.—One teaspoonful every four hours, diluted.

During the attack, attention must be given to the secretions and to the diet of the patient. During convalescence a course of strychninæ sulphas or tinctura nucis vomicæ is valuable.

CAPILLARY BRONCHITIS.

Synonyms. Broncho-pneumonia (?); "suffocative catarrh."

Definition. An acute catarrhal inflammation of the mucous membrane of the *terminal* bronchial tubes, or bronchioles; characterized by fever, impeded and increased respiration, impeded circula-

tion, slight cough and scanty expectoration, and symptoms of non-aeration of the blood.

Causes. Most common in childhood, following exposure to cold or sudden changes of temperature; occurs also in the aged, and also complicates measles, whooping cough, or any of the debilitating diseases. There may be a special germ.

Pathological Anatomy. *Hyperæmia*, redness and swelling of the lining membrane of the bronchioles, with the exudation of a tough, tenacious secretion.

In those cases in which the air cells are not involved the air passes, during the act of inspiration, through the secretion blocking the smaller tubes, but is prevented from escaping during the act of expiration, the secretion in the smaller tubes acting as a valve; the result is distention of numerous vesicles, producing a circumscribed or diffused *functional emphysema*. If the secretion produces complete closure of any of the smaller tubes, the air previously drawn into the vesicles will be absorbed, causing pulmonary collapse (atelectasis).

If the inflammation extends to the alveoli of the lungs, it produces the condition known as *broncho-pneumonia*, a frequent complication in children and feeble elderly people; it is most commonly lobular in character, whence the term "*lobular pneumonia*."

Symptoms. Usually preceded by more or less ordinary bronchitis, followed by *rise of temperature*, 102–103° F., increased pulse, *difficult* and *increased respiration*, numbering forty, fifty, or sixty in the minute, with *paroxysms* in which the dyspnœa is markedly aggravated, when *cyanosis* rapidly develops; the tongue is coated, bowels costive, appetite impaired, and there is restlessness and headache.

The circulation through the lungs is impeded by the dyspnœa, the *pulse* becomes feeble and flickering, and there results general congestion of the venous system, the *countenance* becomes *livid*, the *lips and nails blue*, the *surface cold*, and often covered with a *clammy perspiration*, the *mind dull*, and in children stupor and convulsions rapidly supervene, the result of the *non-aeration of the blood*. The *cough* is slight, but of a *suppressed* character, the *expectoration scanty*, the patient usually swallowing the sputum. When cyanosis occurs, the cough may almost entirely cease; expectoration also ceases, death soon following from *apnœa* and *depression*.

Percussion. *Normal*, except over those portions of the lungs (a

bilateral disease) which are in a condition of *collapse*, when dullness rapidly develops and may as rapidly disappear, changing to other portions of the lungs—shifting dullness.

Auscultation. *First stage*, a feeble, but high-pitched, respiratory murmur, becomes less distinct and harsh as the disease progresses. The râles in the first stage are fine whistling, sibilant, changing in the second stage to fine bubbling or subcrepitant râles. The respiratory murmur is absent over the dull area.

Diagnosis. There is one point characteristic of capillary bronchitis—it is a general or bilateral disease. Capillary bronchitis is often mistaken for true catarrhal pneumonia, the points of distinction between which will be pointed out when discussing the latter affection.

Prognosis. In children, on account of their inability to expectorate, which tends to rapid collapse of the lungs, and in the aged, the prognosis is most grave. In the strong and vigorous, recovery follows prompt and energetic treatment.

Treatment. From the very onset of the attack the treatment must be supporting, with the addition of such measures as seem to possess a controlling influence over the catarrhal process.

The patient must be confined to bed, well covered, and the temperature of the room varying between 75° and 80°, the air moistened with steam, or adding one or two teaspoonfuls of tinctura benzoin to the hot water. In the first stage *dry cups*, mild *sinapis* applications, or *terebinthina stupes* should be applied to the chest, after which it should be covered with an oil-silk jacket or a cotton jacket.

The *diet* must be of the most nutritious character, the great aim being to sustain the powers of life until the catarrhal process has passed through the different stages; hence milk, eggs, chicken, mutton and beef broths, with the free use of *stimulants*, commenced early and in amounts large enough to overcome the signs of depression which are present early in the attack.

Unless the fever be high, 102° F., and continues, it need not be treated, but if it continues at that point or higher, a few doses of *acetanilidum*, gr. ij–iv (0.13–0.26 Gm.), in brandy or whiskey, may be used. If the urine be scanty, use spiritus ætheris nitrosi.

If *suffocation* be imminent, the cautious use of *emetics* may be indicated; the most suitable are *ipecacuanha* and *hydrargyri subsulphas flavus*, or the hypodermic use of *apomorphina*, gr. $\frac{1}{20}$ (0.003 Gm.). Do not repeat emesis often enough to produce exhaustion.

For the catarrhal process two remedies are of inestimable value: one, *potassii iodidum* or *ammonii iodidum*, gr. j–ij (0.065–0.13 Gm.) for a child every hour or two, and gr. v–x (0.3–0.6 Gm.) for an adult, its action being to liquefy or thin the tenacious secretion and modify the inflammatory action; the other is *ammonii carbonas*, gr. j–ij (0.065–0.13 Gm.) for a child every hour or two, and gr. v–x (0.3–0.6 Gm.) for an adult. The two combined, but for the taste, make a valuable prescription:

℞. Potassii iodidi, ... gr. ij .13 Gm.
Ammonii carbonat., ... gr. iij .2 Gm.
Syr. glycyrrh., ... f℥ ss 2. Cc.
Syr. tolu, ... f℥ ss 2. Cc.
Sig.—Every two or three hours.

Excellent results have been obtained in the children's wards of the Philadelphia Hospital from the systematic inhalation of oxygen. Prof. H. C. Wood, in desperate cases of suffocative catarrh, advises the alternate use of the hot and cold douche conjointly with stimulating remedies.

FIBRINOUS BRONCHITIS.

Synonyms. Membranous bronchitis; plastic bronchitis; diphtheritic bronchitis; croupous bronchitis.

Definition. An acute inflammation of the mucous membrane of the larger and middle-sized bronchial tubes, attended with an exudation, forming a membraniform layer, which is closely adherent to the mucous surface; characterized by febrile reaction, cough, difficult breathing, scanty expectoration, followed by the expulsion of the false membrane in the form of patches or casts.

Causes. Unknown; associated with membranous laryngitis from extension downward; asthma; emphysema; phthisis; frequently result of exposure to cold or damp, in those of feeble health or in tuberculous (?) constitutions.

Pathological Anatomy. *Hyperæmia* of the mucous membrane of the bronchial tubes, associated with *swelling* and *œdema*, during which the surface is covered with a whitish or grayish-white, firmly adherent, *membranous deposit*, cemented together by a coagulable exudation, and prolonged by rootlets from its under surface into

the bronchial follicles, which sooner or later is loosened and detached by suppurative process, and is expectorated after a violent fit of coughing or vomiting. When expectorated, the *false membrane*, as it has been termed, has either the form of patches or is thrown off entire from the bronchial tube, and may be found to consist of casts representing more or less of the bronchial subdivisions, and presenting an appearance not unlike "boiled macaroni."

On *microscopical examination*, the detached membrane presents fibrillæ which characterize fibrin or lymph in other situations; and if placed in a solution of acetic acid, it becomes greatly swollen, while ordinary mucus contracts and becomes more dense if added to the same solution.

Symptoms. There are no symptoms or signs by means of which this variety of bronchitis can be distinguished from ordinary catarrhal bronchitis, *prior to the expectoration of the false membrane.*

Expectoration is preceded and accompanied by *violent paroxysms of coughing*, and after more or less of the membrane has been raised, a muco-purulent expectoration, streaked with blood, may be present for several days.

Duration. The inflammation may be either *acute*, *subacute*, or *chronic*, expectoration of patches or strips of the membrane being repeated at intervals of days, weeks, months, or even years.

Prognosis. In adults, favorable, if not associated with other grave affections, such as phthisis, pneumonia, emphysema. In young children it may cause obstruction to the respiration, and not infrequently proves fatal.

Treatment. As the character of the inflammation can seldom be determined until the membrane or portions of it have been expectorated, the treatment is at first the same as in attacks of ordinary acute bronchitis.

As soon, however, as the character of the inflammation can be determined, active *emesis* is the most effective means of removing the obstruction caused by the false membrane, the best agents of this class being either *hydrargyri subsulphas flavus*, *apomorphina*, *ipecacuanha*, or *zinci sulphas*, to be repeated as indicated.

Inhalations of solutions of *ammonii chloridum*, *pix liquida*, *eucalyptol*, or simply the vapor of water, and especially of *lime-water*, are highly serviceable.

To prevent the formation of membrane, Prof. Bartholow strongly

urges the use of *ammonii iodidum* and *ammonii carbonas* combined, in small doses, every hour or two. In a case treated by the author after this method, excellent results followed. *Potassii iodidum* is also useful.

In cases showing a tendency to become chronic, good results will follow the application of flying *blisters* to the chest and the internal administration of *arsenicum* and some preparation of *pix liquida*.

CHRONIC BRONCHITIS.

Synonyms. Chronic bronchial catarrh; winter cough; secondary bronchitis.

Definition. A chronic inflammation of the mucous membrane of the larger and middle-sized bronchial tubes; characterized by cough and more or less profuse expectoration, plus, in many cases, the symptoms of *emphysema* of the lungs, which is a frequent complication.

Chronic bronchitis may be either *primary* or *secondary*.

Causes. *Primary*, exposure to wet or cold, or the repeated inhalation of dust, vapors, or other irritants. *Secondary*, gout, rheumatism, syphilis; cardiac, renal, or pulmonary diseases, or alcoholism.

Varieties. I. *Mucous catarrh*, associated with moderate expectoration. II. *Bronchorrhœa*, profuse expectoration. III. *Dry catarrh*, scanty expectoration. IV. Fetid bronchitis. V. Bronchiectasis, or dilatation of the bronchi.

Pathological Anatomy. The mucous membrane of the bronchial tube is discolored, being of a more or less dull red, often of a deeply venous hue, mingled with a grayish or brownish color. These changes may be either in patches or extensively diffused. The vessels of the mucous membrane are dilated. The mucous membrane is thickened, resulting in reduction in the calibre of the tube and a roughening of its internal surface. The submucous tissue becomes infiltrated, contracted, and indurated.

The elastic and muscular coats of the tubes become hypertrophied, lose their elasticity, and the cartilages become the seat of calcareous deposits.

As the result of the loss of elasticity and muscular tone of the tubes they become irregularly dilated—"*bronchial dilatation*." The dilata-

tions may be uniform in character, resembling somewhat the fingers of a glove, or they may be *sacculated* or *globular*, forming actual cavities in the bronchial structure.

In the *mucous variety* the secretion consists of young cells and mucous corpuscles, having a yellowish color; in the *dry variety*, the "catarrhe sec" of Laennec, or "dry bronchial irritation," the secretion is scanty, tough, semi-transparent, and occurs in globular masses; *in bronchorrhœa*, which is usually associated with bronchial dilatation, the secretion is abundant, greenish-yellow in color, and frequently fetid.

The majority of cases of chronic bronchitis are associated with chronic gastric catarrh.

Symptoms. The most characteristic symptoms of chronic bronchitis are the *cough* and *expectoration*. The cough occurs at all hours, but is more severe at night and early in the morning. The cough is not always present. It disappears almost altogether for a time, and then reappears, continuing thus for years. Coated tongue, disagreeable taste, loss of appetite, impaired digestion, with eructations of gases, are present in many cases, due to the chronic gastric catarrh. Unless associated with other diseases, the general health suffers but little, if at all, constitutional symptoms being present only during acute exacerbations.

Mucous catarrh, or, from its occurring most commonly during the winter months, "winter cough," is characterized by paroxysms of cough, more or less violent, followed by the expectoration of a yellowish mucus.

Dry catarrh is characterized by a harsh cough, a feeling of soreness or rawness under the sternum, and the expectoration of *small globular masses;* this variety occurs with emphysema, gout, rheumatism, and asthma.

Bronchorrhœa, which is associated with *bronchial dilatation*, and most common in the elderly, is characterized by paroxysms of severe coughing, followed by the copious expectoration of greenish-yellow, often fetid, mucus; the amount expectorated often amounts to four or five pints in the twenty-four hours.

Fetid bronchitis, often associated with bronchial dilatation, has an excessively fetid odor of the breath and expectoration. The decomposition of the secretion may cause gangrene of the bronchial mucous membrane, and even of the lung structure.

Percussion. Unless complicated with other affections, *normal;* if bronchial dilatation occur, there are *diffused* spots of the *tympanitic* or *amphoric* percussion sound, the physical condition being a circumscribed cavity containing air and communicating with a bronchial tube.

Auscultation. *Harsh* or *vesiculo-bronchial* respiration, associated with more or less profuse, *sonorous, sibilant,* and *large* and *small bubbling râles;* in *bronchial dilatation,* in addition to the harsh respiration, is found *broncho-cavernous breathing,* with large and small *gurgling râles.*

If *emphysema* complicate chronic bronchitis, the physical signs are somewhat modified, and will be pointed out when discussing that affection.

Diagnosis. Always examine the urine in case of cough, and particularly in chronic bronchitis, as this disease is one of the most frequent complications of Bright's disease.

Incipient phthisis is often confounded with chronic bronchitis. The diagnosis is not always easy. The physical signs of chronic bronchitis are more or less diffused through both lungs, and not, as a rule, associated with failure of the general health; while in phthisis, from the onset, there is failing health, with a concentration of the physical signs to the apices. The discovery of the bacillus determines the diagnosis.

Prognosis. If unassociated with disease of the lungs, heart, or kidneys, chronic bronchitis is never dangerous to life, although the symptoms are present, more or less, continually, and aggravated upon the least exposure. Rarely is a complete cure recorded.

If associated with phthisis, emphysema, diseases of the heart or of the kidneys, the prognosis is governed by these affections. In turn, it is to be remembered that chronic bronchial catarrh may lead to emphysema of the lungs, asthma, or to cardiac dilatation.

Treatment. Cases of chronic bronchitis, of whatever variety, should observe the following general rules: 1. Attention to the general health. 2. The clothing; wearing flannel the year round, or, what is better, silk underclothing, avoiding the opposite extreme of excessive clothing.

The *medical treatment* is guided by the *cause, character,* and *severity* of the disease.

If *secondary* to other affections, in the majority of cases remedies

directed to the bronchial mucous membrane are *contra-indicated*. If the result of the rheumatic or gouty diathesis, in addition to the remedies directed to the disease itself, should be combined change to a warm climate, if possible, and a more or less protracted course of *potassii iodidum*, or *lithii citras*, or a residence at one of the *alkaline springs*.

If associated with alcoholism or chronic gastric catarrh, the following is a valuable combination:

℞.	Ammonii chloridi, ... ʒiij	12. Gm.	
	Tinct. nucis vomicæ, ... fʒij	8. Cc.	
	Infus. gentianæ comp., . q. s. ad fʒiv	ad 120. Cc.	M.

Sig.—Dessertspoonful in water before meals.

For mucous catarrh with acute exacerbations:

℞.	Ammonii chloridi, ... ʒij	8. Gm.	
	Glycerini, ... fʒiss	45. Cc.	
	Codeinæ sulph., ... gr. j	.065 Gm.	
	Vini picis liq., ... fʒiij	90. Cc.	
	Syr. prun. virg., ... fʒiss	45. Cc.	M.

Sig.—Tablespoonful every three or four hours.

Dry catarrh is greatly benefited by—

℞.	Potassii iodidi, ... gr. v–x	.3–.6 Gm.	
	Elix. cinchonæ, ... ♏xx	1.3 Cc.	
	Vini picis liq., ... ad fʒss	ad 15. Cc.	M.

Three times a day.

For an acute exacerbation of dry or tenacious chronic bronchitis:

℞.	Ammonii chloridi, ... ʒiv	15. Gm.	
	Tinct. hyoscyam., ... fʒiv	15. Cc.	
	Syr. scillæ comp., ... fʒiv	15. Cc.	
	Aq. chloroformi, ... fʒij	60. Cc.	M.

Sig.—One teaspoonful every three hours, diluted.

An excellent expectorant combination in all forms and at any stage of bronchial catarrh is:

℞.	Ammonii carbonat., ... gr. xvj	1. Gm.	
	Ext. scillæ fld., ... fʒss	2. Cc.	
	Ext. senegæ fld., ... fʒss	2. Cc.	
	Tinct. opii camphorat., ... fʒiij	12. Cc.	
	Syr. tolu, ... fʒiss	45. Cc.	M.

Sig.—Teaspoonful every few hours, diluted.

For *bronchorrhœa*, *copaiba*, ♏v–x (0.3–0.6 Cc.), every three hours, or *spts. terebinthinæ*, ♏v (0.3 Cc.), every four hours, or *acidum carbolicum*, gr. ss (0.032 Gm.), four times a day, are excellent drugs, or—

℞.				
	Terebeni, ...	f℥ij	8. Cc.	
	Creosoti, ...	♏xxx	2. Cc.	
	Acaciæ, ...	q. s.	q. s.	
	Aq. chloroformi, ...	f℥j	30. Cc.	
	Syr. prun. virg., ...	ad f℥iij	ad 90. Cc.	M.

Sig.—Teaspoonful every three or four hours, diluted.

And at the same time using *ol. morrhuæ* and *arsenicum*, or, if these means fail, inhalations of *alumen*, *acidum gallicum*, or *acidum tannicum*.

If the *expectoration be fetid*, "fetid bronchitis," Prof. Da Costa recommends the internal use of *acidum carbolicum*, ♏j (0.06 Cc.), every third hour, with *inhalations* of *acidum carbolicum*, gr. v (0.32 Gm.), *aquæ*, f℥j (30 Cc.), two or three times a day. Good results may also be obtained from the terebene and creosote mixture given above.

If, after prolonged treatment, cure or great amelioration does not occur, then a change of climate is called for. Usually a warm climate is the most suitable, but sometimes a dry, bracing climate does better.

Locally, irritation with *tinctura iodi*, or flying blisters, repeated once or twice weekly, is of advantage.

ASTHMA.

Synonyms. Bronchial asthma; spasmodic asthma.

Definition. A paroxysmal, spasmodic contraction of the muscular layer surrounding the smaller bronchial tubes, and perhaps associated with a tonic spasm of the diaphragm and more or less bronchial catarrh; characterized by spasmodic attacks of distressing *expiratory* dyspnœa, continuing several hours, days, or weeks.

Cause. A true neurosis of the respiratory apparatus. The result of peripheral or local disturbances in the nervous system. Chiefly hereditary. A family history of asthma, chorea, or epilepsy. It is sometimes of reflex origin, starting from diseases of the nasal mucous membrane, explaining the attacks due to the inhalation of

various substances, as ipecac, turpentine, or irritating dusts. Climate. Some attacks may be due to a peculiar and characteristic disease of the bronchial mucous membrane — an "asthmatic bronchiolitis." Bronchitis; "peri-bronchitis"; emphysema; chronic cardiac disease; chronic gastric catarrh; malarial toxæmia.

Asthma is more common in men than in women, and may occur at any age.

Pathological Anatomy. Unless a "peri-bronchitis," nothing purely distinctive. The changes of emphysema are common.

Symptoms. The onset of a *first attack* of asthma is *abrupt* and *sudden*, the succeeding attacks being preceded by *prodromes*, which the individual rapidly learns to appreciate—to wit: *coryza*, *bronchial irritation*, *thoracic constriction*, marked *dyspepsia*, or the scanty passage of pale, limpid urine, the "hysterical urine."

The *paroxysm* begins, in the majority of instances, in the *early morning hours* or during the *afternoon*, with a *feeling of anguish* and *constriction in the chest* and an *intense desire for air*. The *breathing* is accompanied with *loud wheezing*, the *face is flushed*, at times even *cyanosed* and *bathed in perspiration*, the *eyes staring*, the *eyeballs protrude*, and the muscles of the neck become prominent as they aid in the effort for air. The *dyspnœa* soon becomes so severe that the *inspiration is but a gasp*, the *lips are pallid*, *cyanosis deepens*, and the patient feels as if death were impending. Owing to the tonic contraction of the smaller bronchi, the air drawn into the alveoli escapes imperfectly, resulting in the *expiratory dyspnœa*, the emphysematous chest, and the lowered position of the diaphragm.

After some minutes or hours the *respiration* becomes *easier*, the air in the lungs changes, the cyanosis disappears, and gradually the paroxysm ceases, the patient feeling exhausted and the chest fatigued.

During the paroxysm there is a short, dry cough, becoming looser as the attack subsides. The *sputum* of asthma is unique. Early in the paroxysm it is raised with difficulty, and is in the form of rounded gelatinous masses ("perles" of Laennec). If these pellets be carefully examined, they will be found to consist of moulds of the smaller bronchi, and, under the microscope, show Leyden's crystals and Curschmann's spirals. After a day or two the sputum becomes muco-purulent, and the spirals and crystals are absent.

The *duration* of an attack varies from one to many hours, or even days. Instead of single paroxysms, slight remissions may occur at

intervals of one, two, or three hours, to be followed by exacerbations lasting from four to six hours, continuing for a week or two, preventing the patient lying down or taking food.

Percussion. During the paroxysm, *hyper-resonance* over both lungs, termed *vesiculo-tympanitic*, the "band-box tone" of Bamberger, due to the retained air in the alveoli.

Auscultation. *First stage feeble* or *absent vesicular murmur*, with prolonged expiration associated with loud *wheezing, whistling, sibilant* and *sonorous râles;* as the *paroxysm subsides*, the vesicular *breathing* becomes more apparent and is associated with moist *râles.*

Prognosis. In itself asthma is not fatal to life; but if the paroxysms are frequently repeated, there results either *emphysema, cardiac dilatation* with subsequent dropsy, or even cerebral hemorrhage.

Attacks of asthma frequently occur as a complication in emphysema, chronic bronchitis, valvular diseases of the heart, and Bright's disease.

Treatment. There are two indications to meet: the relief of the paroxysm, and to prevent its recurrence.

To relieve the paroxysm, no medication is so effective as the hypodermic injection of *morphinæ sulphas*, gr. ⅙–¼ (0.011–0.016 Gm.), combined with *atropinæ sulphas*, gr. $\frac{1}{100}$ (0.00065 Gm.). *Chloral*, gr. x (0.6 Gm.), repeated, where no heart complication exists, is often effective. Drinking strong, hot, black coffee is often serviceable. *Caffeinæ citrata* during or at the onset of a paroxysm, in doses of gr. iij–v (0.2–0.3 Gm.), hypodermically, or in a cachet or in solution, repeated until bronchial spasm is relieved, is a valuable drug. Page strongly recommends *sodii nitras:*

℞. Pulv. sodii nitritis, ... gr. xxiv 1.6 Gm.
Aquæ, ... f℥j 30. Cc. M.
Sig.—Teaspoonful at once; repeat in half an hour, once or twice if necessary.

The following combination by hypodermic injection is often most successful in relieving an attack of asthma, and particularly if complicated with cardiac or nephritic disease, continuing the combination after relief, in pill form or solution at ordinary intervals for several days:

℞. Spirit. glonoini, ... ♏ij .12 Cc.
Strychninæ sulph., ... gr. $\frac{1}{50}$ .0013 Gm.
Morphinæ sulph., ... gr. $\frac{1}{20}$ .003 Gm. M.
Sig.— Dose.

Chloroformum, *æther*, or *amyl nitris* inhalations have been recommended, and also the *nauseant expectorants*, *lobelia*, *ipecac*, and *scilla*. *Ext. grindeliæ fld.*, ♏xx (1.3 Cc.), repeated every two or three hours is sometimes useful.

Dr. Pepper speaks highly of the following for the paroxysm:

℞.				
	Ammonii bromidi,	ʒij ℈ij	10.	Gm.
	Ammonii chloridi,	ʒiss	6.	Gm.
	Tinct. lobeliæ,	fʒiij	12.	Cc.
	Spts. ætheris comp.,	fʒj	30.	Cc.
	Syr. acaciæ, q.s.	fʒiv ad	120.	Cc. M.

SIG.—Dessertspoonful in water every hour or two, diluted.

After the use of many drugs I have finally come to depend upon *potassii iodidum*, gr.v–x (0.3–0.6 Gm.), every three hours, either alone or combined with *tinctura belladonnæ*, ♏v (0.3 Cc.), or *nitro*-glycerin, gr. $\frac{1}{200}$–$\frac{1}{100}$ (0.00032–0.00065 Gm.), to remove the catarrhal condition remaining after a paroxysm and to prevent a return.

Another remedy that at times is successful is *syrupus acidi hydriodici*, fʒss–fʒ (2–4 Cc.), every three or four hours, well diluted.

Inhalations of the fumes of *belladonna*, *stramonium*, *nitre-paper*, *chloroform*, *ethyl bromidum*, or the use of various *pastilles* or *cigarettes*, are of immense benefit in many cases. A twenty per cent. solution of *menthol* as an inhalation has been successful in some instances. Inhalations of *oxygen* have given excellent results in a number of cases.

If an *attack* is *impending*, it may often be aborted by drinking freely of strong, *black coffee*, or by full doses of the *bromides*.

To prevent the recurrence of the paroxysms, the general health must be cared for, and any suspected causes corrected. In all cases a thorough examination of the nasal mucous membrane should be made and any diseased condition found removed. If chronic bronchitis be present, it should be persistently treated.

Two remedies long continued frequently give good results: *potassii iodidum* in doses ranging from five to fifteen grains (0.3–1 Gm.), and *arsenicum* in small doses.

Additional aids are systematic exercise short of fatigue, bathing, regulated diet, and, when possible, a change of climate.

HAY ASTHMA.

Synonyms. Hay fever; autumnal catarrh; rose fever; rose cold.

Definition. An acute, specific, catarrhal inflammation of the upper air passages, extending to the bronchial tubes, associated with spasmodic contraction of their muscular layer, occurring at a particular season of the year, characterized by coryza, croupy or wheezy cough, and difficult respiration.

Causes. A predisposition, often hereditary, of the nervous system seems to be a strong etiological factor.

Persons in whom the predisposition exists have attacks excited by the inhalation of the pollen of grasses, rye, corn, wheat, or roses.

Pathological Anatomy. Hypertrophy of the inferior and middle turbinated bones; a peculiar hyperesthesia of the mucous membrane covering the inferior and middle turbinated bones, the middle meatus, the floor of the nose, and that part of the septum below the limit of the olfactory membrane are frequently associated with the disease.

Symptoms. Begins by irritation of the eyes, severe *coryza*, with *sneezing;* a clear, watery, *nasal discharge*, and congested Eustachian tubes, rapidly extending to the *larynx* and *bronchial tubes*, when occurs a *hoarse*, *croupy*, and wheezing *cough*, and *difficulty of breathing*. The dyspnœa occurs in paroxysms, which are often as severe as those occurring during a regular asthmatic attack. There is mild depression of the nervous system in nearly all attacks.

The paroxysms remit after a few days, returning again for several days or weeks, and again remitting, the bronchial catarrh persisting for a month or more.

The constitutional symptoms are mild, unless complications occur.

Complications. The affection may extend to the finer bronchial tubes (capillary bronchitis); congestion or œdema of the lungs and pneumonia are not infrequent.

Duration. Unless a change of climate is resorted to, paroxysms of hay fever continue more or less severe for six, eight, or ten weeks of the year, each year the paroxysms growing more severe.

Prognosis. The affection never proves fatal in itself, but one or more of the following sequelæ may result, to wit: asthma,

chronic bronchitis, or loss of the special sense of hearing or of smelling.

Treatment. No specific, unless the hypertrophy of the turbinated bones be a constant condition, when their removal by the galvano-cautery would remove the liability to attacks.

An attack of hay asthma is often prevented by a *change of climate* during the season of the year when the attacks are most common, to wit: the *early autumn*. Any of the following locations may be selected—White Mountains, Catskills, Adirondacks, Rocky Mountains, or a sea voyage.

Dr. W. C. Hollopeter reports wonderful success in over two hundred patients with the following plan of treatment:

"For the last ten years I have used the ordinary Dobell's solution. This I thoroughly use in both nostrils, first by means of a hand-ball atomizer, after which, with a curved aluminum applicator, I very carefully swab the whole naso-pharynx. I scrub most carefully every portion of the mucous membrane, being sure to reach between the turbinated bones and all around and over every slight prominence. I then as carefully dry the membrane with clean cotton, and use freely blandine comp. (a mild solution of menthol in albolene), loosely plugging the nose for a few minutes to retain the oily application. Great stress is laid upon the thoroughness of the application and the correction of any ills the patient may have."

Attacks are sometimes aborted and always *relieved* by the application to the nares of tablets of *cocainæ hydrochloras*, gr. 1/6 (0.011 Gm.), or a four or six per centum solution, every few hours. On several occasions *pulvis ipecacuanhæ et opii*, gr. v (0.3 Gm.), ter die, has aborted a suspected attack, as has the following pill:

℞. Atropinæ sulph., ...	gr. 1/50	.012 Gm.	
Morphinæ sulph., ...	gr. 1/4	.016 Gm.	
Strychninæ sulph., ...	gr. 1/8	.008 Cm.	
Quininæ muriat., ...	gr. x	.65 Gm.	
Sodii arseniat., ...	gr. 1/6	.011 Gm.	M.

Ft. pil. No. xxx.

Sig.—One every hour until dryness, then two or three hours apart.

Success has followed the use of *quininæ sulphas*, gr. v (0.3 Gm.), three times a day, beginning one month before the expected paroxysm.

Bartholow "has seen several cases benefited greatly" by a solution of *quinina* applied to the nares, as suggested by Helmholtz, "but to achieve success the application must be thorough and timely."

The following applied thoroughly to the nostrils has a high repute:

℞.	Menthol,	ʒj	4. Gm.
	Cerat. simpl.,	℥ij	60. Gm.
	Ol. amygd. dulcis,	fʒiss	45. Cc.
	Zinci oxidi puræ,	ʒj	4. Gm.
	Acid. carbolici,	ʒss	2. Gm.

Sig.—Apply every two hours.

A long course of *arsenicum* in minute doses sometimes removes the susceptibility to the disease.

WHOOPING COUGH.

Synonyms. Hooping cough; pertussis.

Definition. A convulsive, paroxysmal cough, consisting of a number of forcible expirations, followed by a series of deep, loud, sonorous inspirations (the whoop), repeated several times during each paroxysm, and associated with catarrh of the bronchial tubes.

Causes. Chiefly a disease of childhood, and fully one-half of the cases are during the first two years of life, one attack generally removing the susceptibility; contagious; due to an unknown micro-organism.

Pathology. The changes, if any, occurring in the nervous system are unknown. It is said that "irritation of the internal branch of the superior laryngeal nerve produces relaxation of the diaphragm, spasm of the glottis, and a convulsive expiration, the series of phenomena present in a paroxysm of asthma."

Hyperæmia of the mucous membrane of the nares, pharynx, larynx, and bronchial tubes, with diminished secretion, followed by an increased secretion of a transparent mucus, afterward becoming purulent, the mucous membrane pale and anæmic.

Symptoms. Divided into three stages, to wit: *catarrhal*, *spasmodic*, and *terminal*.

Catarrhal stage originates in an ordinary naso-laryngo-bronchial catarrh, with a loose cough. *Duration*, one or two weeks.

Spasmodic Stage: The cough becomes *paroxysmal*, consisting of a succession of *short*, *rapid*, *expiratory* efforts, the face becoming red, the eyes swollen and protruding, the body bending forward, and when these expiratory efforts have exhausted the breath, they are followed

by a *deep, loud, crowing inspiration—the whoop:* each paroxysm being composed of three such spells, the last one followed by the *expectoration* of a small amount of *tough, viscid mucus.*

The attacks of *cough* may be so severe as to cause *vomiting*, and if the vomiting occur shortly after food has been taken, the nutrition of the patient will suffer. Profuse *epistaxis* is not infrequent. *Duration*, about four weeks.

Terminal Stage: The paroxysms recur at longer intervals, are of shorter duration and less intensity, the catarrhal symptoms being more marked, the expectoration freer. *Duration*, one or two weeks, often followed by the "cough of habit."

Complications. Congestion of the lungs, capillary bronchitis, pneumonia, and emphysema, or, rarely, convulsions, hydrocephalus, or apoplexy.

Diagnosis. During the catarrhal stage whooping cough cannot be distinguished from a common cold, but on the advent of the characteristic whoop, the diagnosis is determined.

Prognosis. Depends upon the age and strength of the patient, the severity of the paroxysms, and the presence or absence of complications. Ordinary cases, favorable. Moderately severe attacks during infancy are followed by cerebral symptoms, while attacks occurring in adults are followed by chest symptoms.

Treatment. No specific. A self-limited disease. Remedies will not cure the disease, but often lessen the duration of or modify the severity of the symptoms. Always watch the heart's action.

Prof. Da Costa prefers *quininæ sulphas* in full doses, or *chloral* in good-sized doses, often advantageously combined with the *bromides*, and the use of a spray of *sodii bromidum*, gr. xx (1.3 Gm.), and aquæ, ʒj (30 Cc.), to which may be added *extractum belladonnæ fluidum*, ♏ij (0.12 Cc.). A remedy of great utility is *ammonii bromidum.* Excellent results have followed the use of *antipyrin* gr. ⅙–v (0.011–0.3 Gm.), or *acetanilidum*, gr. j–iij (0.065–0.2 Gm.), every four hours, according to the age, or *phenacetin*, gr. j–ij (0.065–0.13 Gm.), four times daily. Either of these drugs seems to act better if given with an expectorant. L. Emmett Holt recommends *antipyrin*, gr. j (0.065 Gm.), every three hours for child six months old. *Terpini hydras*, gr. j–ij–v (0.065–0.13–0.3 Gm.), is sometimes valuable. *Belladonna* may be added to any of the remedies named with advantage, or the tincture may be used alone in doses of ♏v–x (0.3–0.6 Cc.) three

times daily until flushing of the surface, and a dose continued that maintains the flushing.

Starr recommends the following for a child of one year:

℞. Ext. belladonnæ, ... gr. j .065 Gm.
Aluminis, ... ʒss 2. Gm.
Syr. zingiberis,
Syr. acaciæ,
Aquæ, ... āā fʒj āā 30. Cc. M.
Sig.—A teaspoonful four times in the twenty-four hours.

Inhalations of *creosote* are very valuable, dropped upon cotton in a respirator, or vaporized over an alcoholic lamp, or cloths dipped in solutions may be hung in the room. *Eucalyptol* is also a valuable remedy for inhalation.

The diet of the patient must be regulated, the clothing to be warm but not too heavy, and the patient kept in the *open air* as long as possible.

EMPHYSEMA.

Synonym. Vesicular emphysema.

Definition. Dilatation of or increase in the size and capacity of the air vesicles, characterized by enlargement or distention of the lungs, difficulty of breathing, especially on exertion, and associated sooner or later with dilatation of the heart.

Causes. The *predisposing* cause of emphysema is a hereditary nutritive derangement of the lung structure, often associated with a rigid enlargement of the thorax.

The *exciting* cause is the result either of a *too forcible* and long continued inspiration,—*the theory of inspiration*,—or the *excessive* mechanical distention of the vesicular walls by forced expiration—*the theory of expiration*. But for either of these theories to be operative the lung structure must be congenitally weak, for if violent respiratory efforts alone were the essential factor, the disease would be much more frequent.

What is known as *vicarious emphysema* is a distention of the air cells of the healthy portion of the lung, some other part being the seat of consolidation.

Interlobular emphysema is the presence of air in the spaces between the lobules of the lungs underneath the pulmonary pleura.

Pathological Anatomy. The situation of vesicular emphysema is, in the majority of cases, the *superior portions* of the chest, and is more marked on the *left* side than on the right.

An emphysematous lung feels remarkably soft to the touch, and upon cutting a dull, creaking sound is barely perceptible. It is of a pale-red color; the vesicular walls are thinner and slighter; the vesicles are greatly enlarged, sometimes to the size of a pea or bean, and have an irregular shape, and traversing most of these large sacs (dilated vesicles) a few delicate bands, the remains of the lacerated interalveolar septa, are visible. With the destruction of the septa many of the capillaries are destroyed, leaving the emphysematous tissue remarkably bloodless and dry.

In consequence of the destruction of so many of the capillaries the obstruction to the pulmonary circulation becomes so great that the pulmonary artery and right cavities of the heart are greatly distended; finally the muscular tissue of the heart undergoes granular, followed by fatty, degeneration. The distention of the veins results in a general venous stasis, to wit: nutmeg liver, congested kidneys, and gastro-intestinal catarrh.

Symptoms. The disease is often not suspected until it is well developed. The chief symptoms of vesicular emphysema are *difficulty of breathing* (dyspnœa), greatly aggravated on exertion; more or less *cough*, the result of an attending *bronchitis*, and the various symptoms resulting from *dilatation of the heart*, particularly *cyanosis* without marked distress. The discomfort of the patient is often increased by paroxysms of asthma.

Inspection. The shoulders are rounded, the intercostal spaces widened, the vertical diameter elongated, with circumscribed prominences between the clavicles and nipples, often increased by the act of coughing—the peculiar "barrel-shaped" chest, characteristic of this disease.

The character of the respiratory movements is marked, there being but slight movement observed on forcible respiration, the chest having the constant appearance of a full inspiration.

Palpation. The vocal fremitus is diminished, and the cardiac impulse depressed and nearer to the sternum.

Percussion. The *resonance is increased* (hyper-resonant) over all the emphysematous portions, and, if the whole lung be involved, extends to the seventh or eighth rib anteriorly and to the twelfth rib

posteriorly. The hepatic dullness may not begin until the inferior margin of the ribs is reached; the cardiac dullness is lessened, on account of the emphysematous lung nearly covering the heart.

Auscultation. The vesicular murmur is *weakened*, and in pronounced cases almost *absent*. If bronchitis be present, the inspiratory sound may be rough or sibilant in character, but its duration is always shortened. *Expiration is always prolonged*, and if bronchitis be present, may be associated with more or less pronounced moist or *bubbling râles*.

The *first sound* of the heart is lessened in intensity and duration, the *second sound* being sharply accentuated.

Diagnosis. *Bronchitis* is distinguished from emphysema by the absence of dyspnœa, hyper-resonance of the chest, changes in its shape, size, and movements, and the disturbance of the circulation.

Spasmodic asthma, by the paroxysmal character of the affection, emphysema being a permanent malady, with attacks of asthma.

Cardiac diseases due to other causes than emphysema do not have the characteristic physical signs of that affection.

Prognosis. Vesicular emphysema is essentially a chronic disease. In itself it rarely proves fatal, but if aggravated from any cause, or if associated with frequent or prolonged asthmatic paroxysms, the cardiac changes are hastened, general dropsy supervenes, death occurring from exhaustion, or, more commonly, as the result of intercurrent attacks of pneumonia.

Treatment. It being impossible to restore the altered lung structure, the indications for treatment are to relieve the symptoms and to endeavor to prevent its further progress.

For the relief of the asthmatic paroxysms, *morphinæ sulphas* combined with *atropinæ sulphas* may be used hypodermically, or *ext. quebracho fld.*, f℥ss–j (2–4 Cc.) every hour until relief; *caffeinæ citrata*, gr. ij–v (0.13–0.3 Gm.), repeated, or a combination of *nitroglycerinum*, *strychninæ sulphas*, and *morphinæ sulphas*, or large doses of *potassium iodidum*, frequently repeated, or inhalations of *oxygen*.

For attacks of bronchial catarrh use:

℞. Ammonii chloridi,	℥ij	8. Gm.
Tinct. hyoscyami,	f℥iv	15. Cc.
Glycerini,	f℥j	30. Cc.
Syr. prun. virg.,	ad f℥iv	ad 120. Cc.

Sig.—Half-tablespoonful every few hours, well diluted.

To *prevent the progress of the affection*, remove the bronchial catarrh, relieve the difficulty of breathing, and strengthen the cardiac action, no one combination seems comparable with the following:

℞. Potassii iodidi, ...	gr. v	.3	Gm.
Strychninæ sulph., ...	gr. $\frac{1}{32}$	.002	Gm.
Liq. potassii arsenit., ...	♏v	.3	Cc.
Aq. lauro-cerasi, ...	f℥j	4.	Cc.

Sig.—Four times a day, well diluted.

But of all means hitherto proposed for the relief of emphysema, nothing has approached the *inhalation of compressed air*, by means of the apparatus of Waldenberg.

For attacks of *cyanosis* a free venesection often saves life, combined with and followed by full doses of *spiritus glonoini.*

The *dropsy* arising from failure of the heart to compensate for the circulatory derangement in the lungs may be relieved for a time by the use of *digitalis* and *strychninæ sulphas*, or *caffeinæ citrata*, the last two being cardiac and respiratory tonics and stimulants, and the last mentioned also a diuretic.

HÆMOPTYSIS.

Synonyms. Bronchial hemorrhage; broncho-pulmonary hemorrhage; bronchorrhagia.

Definition. The expectoration of pure or unmixed blood, usually of a bright red color, following the act of coughing.

Causes. In the majority of cases, the result of *tubercular* deposition in the walls of the minute bronchial arteries; excessive cardiac action; bronchial congestion; excessive bodily exertion, straining, lifting, or running; a symptom of *hæmophilia* ("bleeder's disease").

Pathological Anatomy. Hæmoptysis rarely causes death in itself, so that few opportunities for observing post-mortem appearances are obtained, and when they do occur, the location of the hemorrhage is seldom found.

The air passages are more or less filled with clotted blood; the mucous membrane is swollen, and of a dark-red color; rarely, pale and bloodless. The air cells contain blood clots, or are distended with air, the bronchi being filled with clots, preventing its escape.

Unless the clots are rapidly removed by expectoration or absorption, a secondary inflammation develops around about them.

Symptoms. "Spitting of blood" occurs suddenly; rarely, it is preceded by epistaxis, cardiac palpitation, and some difficulty of breathing.

It begins with a sensation of *warmth* under the sternum, *tickling* in the throat, a *sweetish taste* in the mouth, an attempt to remove which by the act of coughing is followed by a *warm, saltish, bright red, frothy liquid* gushing from the mouth and nose. The quantity of blood raised varies from an ounce to a pint. The appearance of the blood depresses the individual, he becoming *pale, tremulous*, often *fainting*.

The attack may subside within half an hour to several hours, returning for several days, in the meantime the expectoration being either bloody or streaked with blood.

A slight febrile reaction, with chest pains, supervenes upon the hemorrhage, the result of the inflammation at the site of the bleeding, which soon subsides, except where blood clots develop a secondary pneumonia, which may undergo the cheesy metamorphosis.

Auscultation. *Coarse, bubbling râles* are heard in circumscribed portions of the chest.

Diagnosis. From *epistaxis*, or hemorrhage from the posterior nares, it is distinguished by the absence of air bubbles and an inspection of the fauces and the nasal cavities.

Hæmatemesis, or hemorrhage from the stomach, differs from hæmoptysis in the blood being *vomited* instead of expectorated, of a *dark color, clotted*, mixed with the acid contents of the stomach, followed with black, tar-like stools, and *the absence of râles in the chest.*

Exceptions to the above occur when the blood from the lungs is first swallowed and afterward raised by vomiting, or when the hemorrhage in the stomach is caused by the erosion of a large artery, the result of ulcer of the stomach; in these cases, however, the raising of blood is preceded by epigastric pain and the blood is not frothy.

Prognosis. Hæmoptysis in itself rarely terminates fatally, although causing much depression; the patient rapidly recovers, unless secondary pneumonia results. In nine cases out of ten it is the diagnostic sign of *phthisis*.

Treatment. *Perfect rest in bed*, the head and shoulder elevated,

and perfect quiet, the diet to be bland, the drinks cool, the patient slowly swallowing small particles of ice. An *ice bag* over the chest, if it does not cause chilliness, is sometimes valuable. *Common salt*, slowly dissolved in the mouth, is a popular remedy, and, if of no real benefit, serves to occupy the attention of the patient and friends until medical advice is obtained.

The hypodermic injection of *atropinæ sulphas*, gr. $\frac{1}{60}$ (0.001 Gm.), will usually at once control a hemorrhage. It may be repeated pro re nata. The one per cent. solution of *nitro-glycerinum* (spiritus glonoini), in half to minim doses every half hour till relief, often promptly stops a hemorrhage.

The hypodermic injection of *ergotin*, gr. x–xxx (0.6–2 Gm.), or the internal administration of *extractum ergotæ fluidum*, ʒss–j (2–4 Cc.), are recommended, but I consider them injurious.

℞. Acidi gallici, ...	gr. xv	1. Gm.
Acidi sulphurici dil., ...	♏x	.6 Cc.
Aquæ cinnamomi, ...	fʒiv	15. Cc.

Sig.—Repeated every fifteen or twenty minutes.

Or *tinctura matico*, fʒj (4 Cc.), or *extractum hamamelis fld.*, ♏xx–fʒj (1.3–4 Cc.), *alumen*, gr. xx (1.3 Gm.), *acidum gallicum*, gr. v–x (0.3–0.6 Gm.), or *oleum terebinthinæ*, ♏v–xv (0.3–1 Cc.), frequently repeated.

If the hemorrhage causes great nervous excitement or depression, *morphina*, either hypodermically or internally, to quiet the patient, is indicated.

Inhalations, by means of the steam atomizer, of either *Monsel's solution* or *tinctura ferri chloridum*, are recommended when the above means fail.

Prof. Da Costa recommends, for frequent small hemorrhages, continuing day after day, *cupri sulphas* [gr. $\frac{1}{12}$ (0.005 Gm.)], ext. opii [gr. $\frac{1}{12}$ (0.005 Gm.)], p. r. n.

DISEASES OF THE LUNGS.

CONGESTION OF THE LUNGS.

Synonyms. Pulmonary engorgement; hypostatic congestion.

Definition. An increase in, or abnormal fullness of, the capillaries of the air cells; *active* congestion when the result of an accelerated circulation; *passive* congestion when caused by an impeded outflow from the capillaries.

Causes. *Active.* Increased cardiac action; over-exertion; alcoholic excesses; mental excitement; inhalation of cold or hot air.

Passive. Obstruction to the return circulation. Dilated heart; valvular diseases; low fevers (hypostatic congestion); Bright's disease.

Pathology. The congested or engorged lung has a bloated, dark-red appearance; its vessels are distended to the uttermost, the tissues succulent and relaxed, blood flowing freely over the cut surface; a bloody, frothy liquid is present in the bronchi, and the alveolar walls are so much swollen that the condensed lung shows scarcely any indication of its cellular structure, resembling the tissue of the spleen (*splenification*).

Symptoms. *Active.* Rapidly developing *thoracic distress* and *difficulty of breathing*, flushed face *; strong, full pulse; throbbing carotids, cardiac palpitation*, and *congested eyes*, with a short, dry *cough*, followed by scanty, frothy *expectoration*, slightly streaked with *blood*.

Passive. Developed slowly, with difficulty of breathing, blueness of the surface, almost continuous hacking cough, followed by scanty, blood-streaked expectoration.

Percussion. The resonance of the lungs slightly diminished, the quality of the sound being somewhat tympanitic.

Auscultation. The vesicular murmur is diminished and accompanied by *sub-crepitant râles.*

Duration. *Active.* Usually from three to five days, terminating either by resolution, hemorrhage, or, rarely, pneumonia. The onset may be so severe and overwhelming that death rapidly supervenes.

Passive. Developed slowly, and subject to great variations, depending upon the cause.

Diagnosis. Active congestion of the lungs cannot be distinguished from the stage of engorgement of a true pneumonia.

Prognosis. An acute congestion of the lungs may prove fatal within a few hours, but under prompt treatment it generally terminates favorably.

The passive form is controlled entirely by the cause.

Treatment. *Active.* In the strong and vigorous *wet cups* to the chest, or, if the symptoms are pronounced, a general *venesection*, and *ice* bags over chest and heart. *Internally*, *tinctura aconiti*, ♏j–ij (0.06–0.12 Cc.), every half hour or hour, as indicated, with *free catharsis* with saline purgatives.

Passive. *Dry* or *wet cups* over the chest, *hydragogue cathartics*, and the internal administration of *digitalis* and *strychninæ sulphas;* if much depression of the vital powers, *stimulants*, such as *spiritus frumenti* and *spiritus ammoniæ aromaticus*, are indicated.

ŒDEMA OF THE LUNGS.

Synonym. Pulmonary œdema.

Definition. An exudation of serum into the pulmonary interstitial tissue and the alveoli of the lungs; characterized by dyspnœa, cough, and a frothy, blood-streaked expectoration.

Causes. Pulmonary œdema is the result of stasis, occurring when the outflow of venous blood in the lung meets an obstacle that cannot be overcome by the right ventricle, as in cardiac diseases, in which the left ventricle fails. Bright's disease; alcoholic excesses, causing cardiac depression. Sequelæ to other lung inflammations.

Pathological Anatomy. The lung tissue is swollen, and does not collapse when the chest is open. The elasticity of the tissue has disappeared, and it pits upon pressure.

If following acute congestion of the lungs, the color is red; if a symptom of a general dropsy, its color is pale.

On cutting into the œdematous spots, an enormous quantity of albuminous fluid, sometimes clear, at other times of a red color, mixed more or less with blood, flows over the cut surface. The liquid is filled with bubbles, is frothy, from being copiously mixed with air, providing the air cells have not been entirely filled with serum, thereby excluding the air.

Symptoms. The pre-eminent symptom is *dyspnœa*, the breathing being *hurried*, *labored*, and *rattling*, all the accessory muscles of respiration being called into action. The *sense of oppression* and *anxiety* is extreme. There is also a *constant*, *harassing*, *short cough*, and the *expectoration* is a *blood-streaked*, *frothy mucus*. The action of the heart may be tremulous or feeble. The face is at first flushed, but as the left ventricle fails, or if the effusion into the air cells be sufficient to prevent the entrance of air, symptoms of *cyanosis* rapidly supervene, the *pulse* becoming *feeble*, the *surface cold*, the *breathing shallow* and hurried, the *cough suppressed*, *stupor* replacing the restlessness, soon deepening into *coma*.

Percussion. If no other lung disease, the percussion note is but slightly, if at all, impaired.

Auscultation. The vesicular murmur is lost by the diffused *subcrepitant* and *bubbling râles*.

Diagnosis. *Acute pneumonia* in the earlier stages is the only condition likely to be confounded with œdema of the lungs, but as the two diseases progress, the picture of pulmonary œdema is so characteristic that it cannot be mistaken.

Prognosis. Grave, and particularly if occurring in pneumonia, cardiac, or Bright's disease. In the majority of instances it is a terminal symptom coming on in all forms of acute and chronic diseases.

Treatment. As a rule, remedies are useless. The indication is to hold up the left heart, and this is best done by hypodermic injections of *atropinæ sulphas*, gr. $\frac{1}{60}$ (0.001 Gm.), repeated, which often has an almost magical effect; or *strychninæ sulphas*, gr. $\frac{1}{24}$ (0.0035 Gm.), repeated every half hour; *caffeinæ citrata*, gr. iij–v (0.2–0.3 Gm.), *sparteinæ sulphas*, gr. j–ij (0.065–0.13 Gm.), every hour or two; or *digitalinum*, gr. $\frac{1}{60}$–$\frac{1}{30}$ (0.001–0.002 Gm.), repeated every hour or two. One or more of these drugs may be advantageously combined. Occasionally relief follows a free venesection or the application of wet cups. Alcoholic stimulants are often invaluable, as is *spiritus ammoniæ aromaticus*, frequently repeated.

The above means may be aided by *counter-irritation* to the chest, or ice-poultices, *hot mustard foot-baths*, active *saline purgatives*, *diuretics*, and inhalations of oxygen.

CROUPOUS PNEUMONIA.

Synonyms. Lobar pneumonia; pneumonitis; fibrinous pneumonia; pleuro-pneumonia; lung fever; winter fever.

Definition. An acute, infectious, croupous inflammation, involving the vesicular structure of the lungs rendering the alveoli impervious to air; characterized by a severe chill, headache, fever, thoracic pain, dyspnœa, cough, rusty sputum, and great prostration.

Causes. Croupous pneumonia is an infective disease caused by the *diplococcus pneumoniæ* of Fraenkel, "which has its seat of election in, and produces its chief effects on, the lung." The micro-organism is found in the sputum and in the lungs in the majority of cases. "Occasionally other micro-organisms seem to occasion typical fibrinous pneumonia. Among these are the pneumococcus of Friedländer, streptococci, staphylococci, the bacillus of typhoid fever, the bacillus of influenza, and the bacillus coli communis. In some cases in which bacteria other than the diplococcus are supposed to be the cause there is doubtless mixed infection, but it must be accepted at the present time that a number of micro-organisms are capable of causing the disease." (Stengel.)

All ages liable. Males more frequently affected than females. One attack predisposes to another. Debilitating causes render individuals more susceptible. Alcoholism is among the most frequent predisposing factors. It is most frequent in winter, at times occurring *epidemically*, the result of atmospheric conditions; exposure to draughts and cold. Gout, rheumatism, diabetes, and Bright's disease.

Pathological Anatomy. The most frequent seat of croupous pneumonia is the lower *right* lobe; the next most frequent seat is the lower *left* lobe; the next, the upper right lobe, although in children and the aged this lobe is affected equally as often as the right lower lobe.

The changes are: I. *Hyperæmia* (engorgement); II. *Exudation* (red hepatization); III. *Resolution* (gray hepatization); or it may undergo purulent transformation or the development of abscesses (yellow hepatization).

I. *Stage of hyperæmia:* Congestion, or engorgement, consists in the vessels of the alveoli being distended, encroaching upon the cavity of the air vesicle; the lung has a reddish-brown color, is heavier,

sinking somewhat lower in water than a normal lung, and having a slight exudation upon the vesicular surface. The same changes are seen in the adjacent bronchioles.

II. *Stage of exudation:* Consists in the exudation of a viscid, fibrinous fluid, mixed with white and red corpuscles and blood, which rapidly coagulate, firmly enclosing the corpuscles and completely filling the alveoli. When the exudation and coagulation are completed, the lung is red, sinks at once when placed in water, and its elasticity is destroyed. When cut into, the color, density, and granular appearance so closely resemble the cut surface of a section of the liver that Laennec termed the conditoin *red hepatization.*

A thin section shows under the microscope, as a rule, the lancet-shaped diplococcus of Fraenkel, as well as staphylococci and streptococci.

III. *Resolution* or gray hepatization follows in the majority of cases, the coagulated albuminous exudation undergoing liquefaction and absorption, the cellular element undergoing a fatty degeneration, the greater part absorbed, the remainder expelled during acts of expectoration, the alveoli returning to their normal condition, both as to capacity, function, and elasticity.

If resolution be retarded and portions of the coagulated exudation undergo *purulent transformation*, changing from a yellowish to a greenish-yellow color (yellow hepatization), pus cells are rapidly formed, the part becoming a granular, fatty mass. The portions of the lung not undergoing this purulent transformation retain the reddish color with intermixed yellowish patches. The purulent contents may be ejected in part, the remainder undergoing fatty degeneration and finally absorption.

Abscess of the lung may result from the lung structure becoming involved in the purulent disintegration. Abscesses may be solitary or in great numbers, which by disintegration of intervening structure form one or more large abscesses; these abscesses either terminate fatally or open into the pleural cavity, causing *empyema* and exhaustion, or open into the bronchi and are expectorated, or an *interstitial pneumonia* is developed and the abscess encapsulated in a firm cicatricial tissue.

Gangrene of the lungs may result from blocking up of the bronchial or pulmonary arteries by coagula during any stage of the disease.

The uninflamed portions of the lungs are hyperæmic and their functional activity is increased.

Death sometimes results from a *general œdema* of the unaffected lung, such cases being often erroneously termed "double pneumonia."

If inflammation of the *pleura* be associated with a pneumonia, the so-called *pleuro-pneumonia*, the changes in the pulmonary pleura are characteristic. "An uneven, thin, downy-looking layer of plastic exudation covers its surface. This plastic layer may conceal the liver-brown color of the pneumonic lung. As the third stage is reached, the opposing surfaces of the pleura may become agglutinated. The pleuritic changes follow very closely those which occur within the lung. The cells in the pleuritic exudation are mainly pus. The pleuritic membrane is opaque, congested, and ecchymotic. It may become so thick as to give a dull note on percussion, after resolution is reached."

Duration of Stages: stage of congestion, from one to three days; *stage of exudation*, from three to seven days; *stage of resolution*, from one to three weeks.

In severe cases or in the very young, the aged, or the depressed, the stage of red hepatization may be fully developed within forty-eight hours.

Endocarditis, either simple or malignant, is a common association. Pericarditis is frequent. The spleen is usually enlarged and soft.

Symptoms. Begins with a severe and usually protracted *chill* (in children often convulsions, adults vomiting), followed by a rapid *rise of temperature*, 103°–104° F.; a strong, full, but *rapid pulse*, soon showing evidence of embarrassed *cardiac* action from obstructed pulmonary circulation, either a *dull or sharp pain* near the nipple, aggravated by pressure, breathing, or coughing; *shortness of breath*, the inspiration short and superficial, the expiration accompanied by a moan or grunt, the number of respirations increasing to 40, 50, or more a minute, causing *interrupted speech;* the ratio between pulse and respiration may be 1 to 2 or more; *cough*, first short, ringing, and harsh, followed by a scanty, frothy mucus, soon becoming semi-transparent, viscid, and *tenacious*, about the second day changing to the familiar *rusty* sputum, becoming more copious and of a yellow color as the disease advances; rarely cases occur with bloody or blood-streaked sputum during the continuance of the fever. There are present *headache*, *sleeplessness*, rarely delirium (early delirium is

a grave sign), save in drunkards; *epistaxis*, *flushed countenance*, and especially over the malar bones is a well-defined mahogany blush; gastric disturbances and scanty, high-colored urine, with *diminished chlorides*, and often *albuminuria*.

From the very onset of the disease the prostration is of the most pronounced character.

The symptoms continue more or less marked until either the *fifth*, *seventh*, *ninth*, or *eleventh* day, when a *crisis* occurs, and within twenty-four hours convalescence is established, recovery rapidly following.

Typhoid pneumonia is a term applied to those cases which are accompanied by signs of *extreme prostration*, *delirium*, *tremor*, very *high temperature*, and profuse and *prolonged exudation*. They may also terminate by a *crisis*.

Bilious pneumonia occurs in cases accompanied by *congestion of the liver* or bile ducts; the result of venous stasis from pulmonary obstruction or from an accompanying *acute catarrhal jaundice*. In malarial districts pneumonia and malaria are often associated, when jaundice more or less pronounced occurs. Such cases are termed *malarial* or *intermittent pneumonia*.

Alcoholic, or pneumonia of the intemperate, has one very characteristic symptom, to wit: *early delirium*. In pneumonia generally the mind is clear, even when all the conditions are unfavorable. Pneumonia of the *intemperate* may begin with symptoms closely resembling an attack of *delirium tremens*, cough, expectoration, and pain being very slight, or even absent.

If *purulent infiltration* follow the stage of red hepatization, instead of the crisis, symptoms of exhaustion occur, with profuse purulent expectoration, high temperature, severe sweats, the tongue brown and dry, sordes collecting on the teeth, low delirium, feeble pulse, rapid, rattling breathing, the recovery slow, and convalescence tedious.

Pneumonia in the aged or the insane may be latent, coming on without chill or pain and with only a slight fever; the cough and expectoration are slight, physical signs ill-defined and changeable, and the constitutional symptoms out of all proportion to the amount of lung involved.

Apyretic pneumonia are attacks minus fever, the result of exhaustion and the depressing effect of the infecting agent on the nervous system.

Aspiration pneumonia is due to the aspiration of fluids of any kind, the disease being really of mechanical origin.

Traumatic pneumonia is the variety resulting from severe contusions of the chest, the trauma predisposing to the disease by mechanical injury of the lung, the diplococcus finding suitable nidus at the site of injury.

Inspection. *First stage*, deficient movement of the affected side, due to pain.

Second stage, the healthy side rises normally, the affected side lagging behind. If both lower lobes are impervious to air, the diaphragm cannot descend and the epigastrium does not project during inspiration, the breathing being conducted by the upper part of the chest (superior costal respiration).

Palpation. *First stage*, the *vocal fremitus* more distinct than normal.

Second stage, the vocal fremitus is markedly *exaggerated* except in those rare instances of occlusion of the bronchi by secretion.

The *cardiac impulse* is felt in the normal position.

Percussion. *First stage*, the percussion note is slightly *impaired*, indeed, at times having a hollow or tympanitic quality.

Second stage, *dullness* over the affected parts, with an increased sense of *resistance*.

Auscultation. *First stage*, over affected part, *feeble vesicular murmur*, associated with the true vesicular or *crepitant* (crackling) *râle*, most distinct during inspiration.

Second stage, harsh, high-pitched, *bronchial respiration*, at times resembling a to-and-fro metallic sound, except in those rare instances in which the bronchi are more or less filled with secretion.

Bronchophony, or distinctly transmitted voice, at times *pectoriloquy*, or distinct transmission of articulated sounds, is present.

Third stage, breathing changing from bronchial to *vesiculo-bronchial*, the *crepitant* (crepitatio redux) *râle* returning, and if resolution proceed, the breath sounds are associated with *large* and *small moist* and bubbling *râles*.

"The morbid phenomena, physical signs, and symptoms of the malady correspond usually in this matter." (Da Costa.)

I.	Stage of engorgement and beginning exudation.	Crepitant râle; slight percussion dullness.	Cough; beginning dyspnœa and rapidly developed fever heat.
II.	Stage of solidification of lung tissue (red hepatization).	Percussion dullness; bronchial respiration; bronchophony.	Rusty-colored sputum; dyspnœa; cough; high fever with marked evening exacerbations and morning remissions.
III.	Stage of softening (gray hepatization).	The same physical signs as in the second stage, unless large abscesses have formed.	Chills; prostration, etc.; purulent or brownish sputum; generally high temperature.

Terminations. Asthenic cases recover within two weeks. When purulent infiltration supervenes, the disease pursues a tedious course of several weeks' duration, with a low exhaustive fever.

If death occur during the first or second stages, it is usually the result of a *collateral œdema* of the uninflamed lung, or *cardiac failure* and *impaired nerve force.*

If *abscesses* occur, there are exhausting sweats, frequent cough, with a large amount of yellowish-gray, at times blood-streaked, expectoration.

Gangrene of the lungs is a rare termination; it is associated with symptoms of collapse, the expectoration of a blackish, fœtid character, with the physical signs of a pulmonary cavity.

Diagnosis. *Œdema of the lungs* may be confounded with the first stage of pneumonia, but the subsequent history, its presence on both sides, and the waterish expectoration and absence of chill and pain and the physical signs of pneumonia soon determine the diagnosis.

Pleurisy is oftener confounded with pneumonia than any other disease, the points of distinction between which will be pointed out when discussing that affection.

Complications. *Acute pleuritis* is a frequent complication of croupous pneumonia, occurring as often as from ten to twenty-five per cent. of cases. The more acute localized pain, the greater embarrassment of respiration, and the usual physical signs of effusion are the evidences of a *pleuro-pneumonia.*

Endocarditis is a common complication, showing irregular but protracted temperature record, with chills and sweats and great embarrassment of the respiration.

Capillary bronchitis is a rare but dangerous complication. *Pericarditis*, *rheumatism*, and *gout* are rare complications.

Prognosis. Depends upon the extent of the inflammation, the dangerous features of croupous pneumonia being cardiac failure, the result of an endo- or myocarditis or of embarrassed respiratory circulation, and the rapid tissue waste, associated with extreme fever (105°), resulting in impaired nerve force. Double pneumonia has a very grave prognosis, but it is not nearly so frequent as was at one time supposed. The coexistence of pleuritis adds to the gravity of the prognosis, although not so fatal as generally supposed. Pneumonia of drunkards almost invariably terminates fatally. Typhoid pneumonia, pneumonia of the aged and in the insane, and the so-called bilious pneumonia, purulent infiltration, abscesses of the lungs, and gangrene, all give a grave prognosis.

Treatment. If pneumonia be regarded as a constitutional malady with a local lesion, then the consolidated lung no more calls for treatment than does the intestinal ulcer of typhoid fever, but the *general* condition of the patient is to govern in the management and not the local changes in the thorax. A simple pneumonia attacking persons previously in good health requires no more active treatment than any of the so-called self-limited diseases, provided only that the extent of the disease be moderate, and there be no complication.

The much-discussed question of *venesection* is now a settled problem in the affection; if we bleed, it is "*not because of pneumonia, but in spite of pneumonia.*" Called to a case in the first stage or early in the second stage, who has been vigorous and otherwise healthy, with a high temperature, 105° or more, with frequent pulse, one hundred and twenty beats or more, or a slow, full pulse showing cardiac oppression, flushed surface, and marked dyspnœa, a copious bleeding is indicated, and the same may be said when symptoms of collateral œdema threaten; this is bleeding for symptoms and not for the disease per se.

There is no remedy which can exert a favorable influence upon the pneumonic process. Many cases recover without, and many cases in spite of, treatment. When treatment is instituted, be guided by the fact that you are not to treat pneumonia, but a patient with a pneumonia.

At the onset, if venesection is not indicated, relief of the pain may

follow the use of dry or wet cups. If the tongue be coated and the gastro-intestinal canal deranged, a calomel purge is indicated.

℞. Hydrargyri chloridi mitis, . . . gr. ij .13 Gm.
Sodii bicarb., ... gr. iv .26 Gm.
Pulv. ipecac., ... gr. j .065 Gm. M.
Ft. chart. No. iv.
Sig.—One every two hours, followed in two hours after last powder by mild saline.

Action on the skin and kidneys by refrigerant mixtures or small doses of Dover's powder is valuable. The administration of the arterial sedatives, aconitum and veratrum viride, are recommended by Drs. Da Costa and H. C. Wood. In pneumonia of children the use of small, frequently repeated doses of *tinctura aconiti* in the early stage is most useful.

Poultices are of slight value, but the use of home-made mustard plasters, weakened with flour, is useful in all stages. If the heart be weak from the onset, either of the following are valuable: *digitalis*, *caffeinæ citrata*, *nitro-glycerinum*, *spartein*, or *strychnina*. Indeed, it seems a good practice to administer strychnina in full doses from the onset. *Quininæ sulphas*, gr. ij–v (0.13–0.3 Gm.) every three or four hours, is always valuable.

Second Stage. It is at this period of a severe attack of acute pneumonia that two prominent indications for treatment arise—*heart insufficiency* and *high temperature.*

To sustain the heart is one of the most important indications, for experience shows that cardiac failure is responsible for a large number of deaths in this affection. *Strychninæ sulphas*, gr. $\frac{1}{32}$–$\frac{1}{20}$ (0.002–0.003 Gm.), repeated every few hours by mouth or by the hypodermic method, or *caffeinæ citrata*, gr. ij–v (0.13–0.3 Gm.) every four hours, or *tinctura strophanthus*, ♏v–x (0.3–0.6 Cc.) every three hours, are valuable cardiac tonics in pneumonia. The availability of *digitalis* and *nitro-glycerinum* depends upon a careful study of the pulse. If the tension is low, the result of relaxation of peripheral blood vessels, —vaso-motor paralysis,—*digitalis* in full doses is indicated; but if the tension is high, with embarrassed right heart, *nitro-glycerinum* every hour or two, with *spiritus ammonii aromaticus*, is the indication. *Alcoholic stimulants* judiciously employed are most efficient means for preventing or overcoming the cardiac failure. The amount can

only be determined by a careful study of each case, as a few ounces in the twenty-four hours may answer in one, while another may require eight or ten ounces. It is well to begin with small doses, increasing or decreasing as its effects are good or bad. *The indicator of the heart's condition is the pulse.* In the aged, the feeble, or in those accustomed to the use of alcohol, stimulation is indicated from the onset. Other indications would be a frequent, feeble, irregular, or intermitting pulse; a dicrotic pulse; delirium, muscular tremor, and subsultus; immediately following crisis, and the period of collapse.

To reduce the temperature is at times an important indication. If the fever is under 103° F., cool sponging with alcohol and water, or water alone, is sufficient. If the temperature is above 104° F., *antifebrin*, gr. v (0.3 Gm.), may be used every three hours until a reduction occurs. *Strychninæ sulphas*, or *caffeinæ citrata*, may be added to each dose. *Phenacetin* or *acetanilidum* are also valuable, and considered less depressing, but it is to be remembered that a temperature under 104° is as normal to pneumonia as the dyspnœa or the rusty sputum, and so use antipyretic drugs with caution.

The use of the cold pack or of cold baths for reducing the temperature in acute pneumonia has not given the success expected.

Dr. Mays strongly advocates the use of *ice bags* to the chest in pneumonia. He says: "Very often it is found that the application of the ice to an affected spot is immediately followed by a marked lowering of the temperature and improvement in the physical signs in the part." I am able, from an experience of five years, to endorse this statement.

For *dyspnœa* and pain, a hypodermic injection of *morphinæ sulphas*, repeated p. r. n. The dyspnœa is often relieved by inhalations of *oxygen*, but do not expect too much from oxygen as there is some additional factor besides the mechanical one of consolidation of the lung producing the dyspnœa, for the consolidation is just as marked immediately after the crisis, while the dyspnœa is wonderfully relieved.

The diet must be of the most nutritious but easily digestible character, and given at periods of every three hours, watching that the food is assimilated. A distended stomach and abdomen is dangerous. Strong black coffee throughout the disease is valuable.

Third Stage. The treatment is a continuation of that of the second stage, with the addition of the following valuable combination:

℞. Ammonii chloridi, ...	gr. v–x	.3–.6	Gm.	
Strychninæ sulph., ...	gr. $\frac{1}{24}$	.003	Gm.	
Aquæ chloroformi, ...	f℥j	4.	Cc.	
Syr. prun. virg., ...	f℥iij	12.	Cc.	M.

Sig.—Every three hours, diluted.

Many cases are favorably influenced by an expectorant from the onset of the disease.

Convalescence. Nutritious diet, *quininæ sulphas* in tonic doses, *ferrum*, together with a good blood-making wine or a good preparation of malt. If the consolidation shows a disposition to linger, blisters may be used.

The various symptoms other than those particularly mentioned are to be met, as they arise, by their proper remedies.

For typhoid pneumonia, purulent infiltration, abscess of the lungs, or pneumonia in drunkards, the weak, or the aged, *quininæ sulphas*, *ferrum*, *nutritious* diet and bold *stimulation*, and the free use of *ammonii carbonas* or *spiritus ammoniæ aromaticus*, *caffeinæ citrata*, and *strychninæ sulphas*,—these last two being respiratory and cardiac tonics,—are the indications.

Sleeplessness is an annoying symptom frequently requiring treatment. Balfour, of Edinburgh, advocates *chloral.* With *strychninæ sulphas* it is safe and satisfactory. The same can be said for *trional* with *strychninæ sulphas.*

The so-called *antiseptic* treatment of acute pneumonia is still under trial, and no definite opinion can be expressed concerning it.

CATARRHAL PNEUMONIA.

Synonyms. Broncho-pneumonia; lobular pneumonia; capillary bronchitis (?).

Definition. An acute catarrhal inflammation of the bronchioles and alveoli of the lungs, characterized by fever, cough, dyspnœa, copious expectoration, and great depression.

Causes. From an extension of a bronchial catarrh downward; following the eruptive fevers, especially measles; complicating whooping cough. Persons of the rickety or scrofulous diathesis, in whom there is a greater irritability of the epithelial elements, are particularly predisposed to this form of pneumonia on slight exposure; emphy-

sema; diseases of the heart; most frequently seen in childhood and old age. The inspiration of particles of food and mucus in the last stages of low diseases—the *aspiration* or *deglutition* pneumonia—is of the catarrhal variety.

Bacteriological investigations seem to indicate that broncho-pneumonia is due to more than one germ, although the diplococcus pneumoniæ is the most frequent etiological factor.

Pathological Anatomy. *Hyperæmia* of the mucous membrane of the bronchi, extending to the connective tissue of the bronchioles and accompanying arterioles and to the alveoli, with *swelling* and *succulence* of these tissues, accompanied by an *abnormal secretion* and an immense *production* of *young cells* from the proliferation of the bronchial and alveolar epithelium, admixed with a yellowish, creamy, mucoid material, which blocks up the bronchioles and air cells.

The affected parts first have a reddish-gray, soon changing to a yellowish-gray, color, due to the rapid metamorphosis of the newly developed cells. If the fatty change be completed, absorption takes place and the consolidation is removed; if it remain incomplete, the cells atrophy, the little mass becoming caseous, and the disease passes into a chronic state.

The bronchial tubes also participate in the disease; the walls become thickened, from a hyperplasia of the connective tissue (*peribronchitis*), and their calibre is often dilated.

Symptoms. Catarrhal pneumonia begins as a catarrhal bronchitis. It may be either *acute*, *subacute*, or *chronic* in its course.

Acute variety: Its onset is announced by a gradual *rise of temperature* to 102°–103° F., the febrile phenomena assuming a typical remittent character, with *rapid*, laborious, and shallow *breathing*, as shown by the widely dilated nares and violent action of all the accessory muscles, while the insufficient distention of the lungs is shown by the great recession of the lower part of the chest walls and sinking in of the intercostal spaces. The *inspiration* is short and imperfect, the *expiration* noisy and prolonged; the *pulse* is *frequent*, 100–120 or more, and somewhat compressible; the *cough*, which, during the bronchitis, was loose, now becomes *short*, *hacking*, dry, and *painful*, soon followed by more or less copious *muco-purulent expectoration;* the appetite is impaired, *bowels* somewhat *loose*, urine scanty, high-colored, and the surface frequently covered with a more or less *profuse perspiration.*

The *subacute* and *chronic* varieties have the same general symptoms, but the duration is longer and the exhaustion greater.

The progress of catarrhal pneumonia is sometimes, although not often, a very acute one. The disease may prove fatal in a few days, especially if it attack feeble children; in such the countenance becomes pale and livid, the lips bluish, the eyes dull, and a restlessness giving place to apathy, and a continually augmented somnolence.

Resolution, when it occurs, is by *lysis*, several weeks elapsing before complete recovery.

Percussion. *Dullness*, scattered in patches, over both lungs, the intervening healthy lung often giving a more or less *hollow* or *tympanitic* note.

Auscultation. *Vesiculo-bronchial* breathing, changing to moist bronchial breathing, associated with *small bubbling* (sub-crepitant) *râles*. As the disease progresses toward resolution, the râles become larger (large bubbling) and more numerous. If pneumonic phthisis result, physical signs indicative of that condition are soon evident.

Sequelæ. Attacks of catarrhal pneumonia complicated with atelectasis, or collapse of the lobules, when recovery occurs, are followed by emphysema of the lungs.

If the catarrhal products which fill the alveoli and bronchioles and intervening connective tissue do not rapidly undergo complete fatty metamorphosis and consequent absorption, *pneumonic phthisis* results.

Diagnosis. *Ordinary bronchial catarrh* differs from catarrhal pneumonia by the absence of dyspnœa, fever, and dullness on percussion, and the presence of the large bubbling râles, and also by the subsequent history of the two affections.

Croupous pneumonia is a unilateral disease; catarrhal pneumonia is bilateral and diffused over both lungs—the former a self-limited disease, the latter having no fixed duration.

Acute tuberculosis at its onset is characterized by the presence of a capillary bronchitis, a differentiation being possible only by a study of the clinical history and course of the two maladies and the presence or absence of the tubercular bacilli.

Œdema of the lungs is a bilateral disease associated with a short, dry cough, and dyspnœa, but lacks the previous catarrhal history and high temperature of catarrhal pneumonia.

Prognosis. Fully one-half of the cases of true catarrhal pneu-

monia terminate fatally. The prognosis must be guarded in scrofulous or rachitic subjects, or those enfeebled by other diseases, for, unless prompt resolution can be effected, it will terminate fatally early, or develop pneumonic phthisis. Have seen cases continuing up and down for eight and ten months, and finally make a good recovery.

Treatment. Confinement to bed is paramount, although the position of the patient is to be frequently changed. The *diet* must be of the most nutritious character, administered at frequent intervals: milk, eggs, chicken, beef, mutton and oyster broths are the most suitable articles. The steady use of *brandy* or *whiskey* throughout the attack is of importance, regulating the amount by the age of the patient and the severity of the attack.

Locally a weak mustard plaster followed with a cotton-batting jacket is valuable. Poultices are of little use. The febrile symptoms and early cough are often modified by the following mixture:

℞. Potassii citratis, ...	ʒvj	24.	Gm.
Spts. ætheris nitrosi, ...	fʒiv	15.	Cc.
Tinct. opii camphorat., ...	fʒiv	15.	Cc.
Liquor. potassii citratis, . . . ad	fʒvj	ad 180.	Cc. M.

Sig.—Dessertspoonful every three hours.

Early in an attack, in children with high temperature, *tinctura aconiti*, in small, frequently repeated doses is valuable. If the fever persists, a combination of *phenacetin* or *antifebrin* with *camphor* or *digitalis* is useful. The ice bags or poultices are as strongly urged for bronchopneumonia as for croupous pneumonia, and in sthenic cases should be given a trial.

For the *catarrhal process*, the air of the apartment should be maintained at an even temperature and moistened by disengaging the vapor of water in it. The following combination is of great utility in nearly all cases, regulating the dose in accordance with the age of the patient:

℞. Ammonii carbonat., ...	gr. v	.3	Gm.
Ammonii iodidi, ...	gr. v–x	.3–.6	Gm.
Mucil. acaciæ, ...	q. s.	q. s.	
Syr. glycyrrh., ...	fʒj	4.	Cc.
Syr. prun. virg., ... q. s. ad	fʒiv	ad 15.	Cc.

Sig.—Every three hours.

A much pleasanter way of administering the *ammonia* salts is in

capsules, each containing about two and one-half grains of each salt with an aromatic oil. *Terpinum hydras* acts remarkably well in many lingering cases. The *spiritus ammonii aromaticus* in either chloroform or cherry-laurel water makes an excellent mild, stimulating expectorant.

For *convalescence*, nutritious food, *ferri iodidum*, *quininæ sulphas*, and *oleum morrhuæ*.

Locally : repeated application of mustard poultices or turpentine stupes, followed by cotton jacket. If the inflammatory processes tend to become chronic, scattering blisters should be used.

PULMONARY TUBERCULOSIS.

Synonyms. Phthisis pulmonalis ; phthisis ; consumption ; pneumonic phthisis ; tubercular phthisis.

Definition. An infective disease, caused by the *bacillus tuberculosis*, the lesions of which are characterized by nodular bodies called tubercles or diffused infiltrations of tuberculous tissue, which undergo caseation or sclerosis, and may finally ulcerate, or, in some situations, calcify. (Osler.)

Clinical Varieties. I. Acute miliary tuberculosis ; II. Pneumonic phthisis ; III. Tubercular phthisis ; IV. Fibroid phthisis.

Cause. It is now generally accepted that all varieties of pulmonary consumption are due to the active presence of the *bacillus tuberculosis*, discovered by Koch in 1880. The lung tissue must be in a receptive state, as the bacilli may be present in the respiratory tract without the development of the disease.

Any condition that lowers the tone of the general system renders the tissues susceptible to the changes produced by the tubercle bacilli. These will be enumerated in speaking of the clinical varieties of the disease.

ACUTE MILIARY TUBERCULOSIS.

Synonyms. Acute phthisis ; galloping consumption.

Definition. An acute infective febrile affection, due to the rapid eruption in various parts of the body, but especially in the lungs, of miliary tubercles ; characterized by high fever, rapid pulse, hurried

respiration, pains in the chest, cough, profuse expectoration, and rapid prostration.

Causes. In the majority of cases it is the result of an auto-infection, arising from either an active or latent tuberculous focus. Cases develop in which no cause can be assigned. Often follows measles, whooping-cough, variola, and influenza.

Most frequent between puberty and middle life.

"That the gray granulation is deposited throughout the body under the influence of certain conditions of irritation, it is necessary that a peculiar vulnerability of the constitution exist—in other words, that it be of the scrofulous type."

Clinical Forms. *General or typhoid, pulmonary* and *cerebral.* The cerebral will be described in the section on nervous diseases.

Pathological Anatomy. Pulmonary form. "The gray granulation or miliary tubercle consists of a fine reticulation of fibres, with a mass of epithelioid cells and granules, and often having a giant cell for its centre."

The deposit is generally over both lungs and the bronchial tubes, and is followed by hyperæmia, increase of secretion, having a viscid and adhesive character, and the destruction of all the tissue with which it comes in contact.

Deposits also take place in the brain, pleuræ, intestines, peritoneum, and kidneys.

General or Typhoid.—*Symptoms.* Gradual progressive weakness, with loss of appetite; dry, clean tongue; costive bowels, flushed cheeks; fever, irregular in type, and rapid, feeble pulse. Rarely the temperature reaches 103° F., to 104° F., associated with a mild delirium. The respirations are increased with slight or no cough, and little or no expectoration. Often the symptoms of a diffused bronchial catarrh of the smaller tubes are present. As the symptoms continue the prostration increases, cyanosis develops, the patient growing stupid, gradually deepening into coma and death.

Diagnosis. The symptoms of acute phthisis point to an acute general infection, and the disease is apt to be mistaken for typhoid fever. The points of difference are the absence of the typical typhoid, or step-like, temperature record, the characteristic eruption, and the diarrhœa. The differential diagnosis can be more readily determined by the Widal test and the diazo-reaction in the urine.

Prognosis. Recovery is the rarest termination.

Treatment. Expectant and symptomatic.

Pulmonary Form. *Symptoms.* The onset is usually sudden, with a *chill* or *chilliness*, followed by *fever*, 102°–104° F., *rapid*, dicrotic *pulse*, 120–140, *cough*, with scanty, glairy sputum, *increased respiration*, 30–50 per minute, *pain* in the chest, hot skin, dry tongue, deranged digestion, and *great prostration*, the severity of the symptoms rapidly increasing, with evidences of *cyanosis*, the sputum becoming more abundant and often rusty in color, with more or less frequent attacks of *hæmoptysis*, soon followed by headache, vertigo, sleeplessness, often delirium, coma, and death.

If deposits have occurred in the meninges or the intestines, symptoms of these affections are superadded.

Percussion. The percussion resonance is normal until considerable deposits have occurred, when it is either slightly *impaired* or even slightly *tympanitic*. With the development of cavities the *amphoric* percussion note is present.

Auscultation. Often little change in the vesicular murmur, but diffused râles of bronchial catarrh, or *vesiculo-bronchial* breathing, associated with large and small, moist or *bubbling râles*, soon followed by *bronchial* and *broncho-cavernous* breathing, with large and small, moist and circumscribed *gurgling* râles.

Duration. Acute phthisis usually terminates fatally in from four to twelve weeks. Rarely of several months' duration.

Diagnosis. Commonly mistaken for typhoid fever with lung complications, an error that is readily made unless a close study of the history, symptoms, physical signs, and sputum be made. The Widal test may assist in determining the diagnosis.

Treatment. There are no means of retarding the progress of this malady. Loomis says: "Morphia in small doses—$\frac{1}{20}$ of a grain (0.003 Gm.) hypodermically every six or eight hours—has, in my hands, been more satisfactory in staying the progress of the disease, prolonging life, and keeping the patient comfortable than any other plan."

Dr. McCall Anderson claims that subcutaneous injections of atropinæ sulphas check the exhausting sweats, and that quininæ sulphas, digitalis, and opium reduce the temperature, and if they fail, ice-cloths to the abdomen will accomplish the desired result.

The various symptoms should be met as they occur, the patient at the same time being supplied with large quantities of *stimulants*, and full doses of strychninæ sulphas and arsenicum.

PNEUMONIC PHTHISIS.

Synonyms. Chronic catarrhal pneumonia; catarrhal phthisis; caseous pneumonia; caseous phthisis.

Definition. A form of pulmonary consumption characterized by the destruction of the pulmonary tissue resulting from the action of the bacillus tuberculosis, causing the *caseation* or cheesy degeneration of inflammatory products in the lungs, and the subsequent softening and destruction of the caseous matter, with greater or less destruction of the pulmonary tissue; characterized by hectic fever, cough, shortness of breath, purulent expectoration, and more or less rapid prostration.

Causes. The *predisposing* factor in the etiology of pneumonic phthisis is a strumous or scrofulous diathesis, or a condition of lowered health, the result of various unfavorable hygienic influences.

The *exciting* causes are: the irritation produced by the presence of the bacillus tuberculosis and a catarrhal pneumonia in any portion of the lung, but especially at the *apex;* inflammation occurring about a blood clot; inhalation of irritant particles occurring in such occupations as weaving, grinding, mining, milling, cigar-making, and the like. Many cases of pneumonic phthisis can be traced to an attack of influenza a year or so before in individuals having the peculiar diathesis.

Pathological Anatomy. When a pneumonia terminates in resolution, the inflammatory products are absorbed by first undergoing a *fatty metamorphosis*. If the fatty metamorphosis be incomplete, the cells are atrophied and undergo the *caseous degeneration*, which consists in the absorption of the watery parts, the fatty degeneration of the cellular elements, and the granular disintegration of the fibrinous material, so that ultimately a soft, solid mass is produced, yellowish in color, having the appearance of cheese.

The destructive changes are thus described by Niemeyer: "Cells, the products of inflammation, accumulated in the alveoli and minute bronchi, crowd upon each other, becoming densely packed, and thus by their mutual pressure they bring about their own decay, as well as that of the lung textures, by interfering with their nutrition, the alveolar walls being also themselves damaged by the inflammatory process."

The position of the catarrhal pneumonia resulting in the above

changes is usually at the apex or under the lower inner scapular region, but it may occur at any portion of the lungs, or a whole lung becomes infiltrated, and undergoes the cheesy degeneration (phthisis florida).

As in croupous pneumonia, so in pneumonic phthisis is there involvement of the overlying pleura of tubercular character in the latter disease. Rarely rupture of lung and pleural structure occur, causing tubercular pneumohydrothorax.

Symptoms. Pneumonic phthisis occurs in three forms—the *chronic*, the *subacute*, and the *acute*.

Chronic form. The origin is rather insidious, the individual being susceptible to "colds," or "catarrhs," on the slightest exposure; gradually a *persistent cough*, with the *expectoration of muco-pus*, is established, each severe cold being accompanied with *chill, fever, pain* in the chest, and either slight *hemorrhages* or *blood-streaked sputa*. Finally, the catarrhal symptoms become persistent, with morning *chills*, evening *fevers*, and rather profuse *night-sweats*, distressing cough, profuse muco-purulent sputa, containing the bacilli, great weakness and exhaustion, loss of appetite and feeble digestion, the symptoms growing persistently worse, *death* occurring from *exhaustion* after one or two years' duration.

Subacute variety. History of an acute attack of pneumonia of one or two weeks' duration, followed by a decided improvement, but not complete recovery. After a lapse of some weeks or months symptoms of pulmonary *softening* begin, destroying the lung structure and forming cavities, accompanied by *chills*, *fever*, *night-sweats*, *emaciation*, *cough*, *muco-purulent* and *blood-streaked expectoration* containing the bacilli, the patient dying from exhaustion within a year.

Acute variety, the so-called *phthisis florida*, runs a rapid course, beginning either as a croupous or catarrhal pneumonia, involving the whole of one or part of both lungs, associated with rapid *loss of flesh* and strength, *high* but variable *temperature*, 103°–105° F., with remissions, profuse *night-sweats*, *shortness of breath*, severe cough, *profuse*, purulent, and *blood-streaked sputa* containing the bacilli, *loss of appetite*, and *feeble digestion*, the patient succumbing in a few weeks or months from exhaustion.

A decided remission in the local and general symptoms of the acute variety may occur, the disease afterward pursuing a more chronic course.

Inspection. Shows *deficient* respiratory *movements* of the diseased portion of the lungs.

Palpation. *Increased* vocal *fremitus* over the consolidated lung tissue and cavities.

Percussion. The percussion note varies from a slight *impairment* of the normal note at either apex to *dullness*, and when cavities are formed, associated with scattered points of the *tympanitic* or *hollow* note. If the cavities communicate with a bronchial tube, the *cracked-pot* or *cracked-metal* sound is elicited. If the cavities are filled with pus, the percussion note is *dull*. If the pus be expelled, the tympanitic or cracked-pot sound returns.

Auscultation. The vesicular murmur is unimpaired in those parts free from disease; it is *feeble* or indistinct if many bronchioles are obstructed; and is harsh or *blowing* if the bronchioles are narrowed. The *inspiratory* sound will be *jerking*, and the *expiratory* sound *prolonged* and *blowing* when the lung has lost its elasticity.

Associated with the impaired vesicular murmur is a *fine, dry, crackling sound* (crepitation), appearing at the *end of inspiration*. If bronchitis be associated, large and small *moist* or *bubbling* râles are also heard during respiration.

When cavities form, either *bronchial* or *broncho-cavernous* respiration is heard, associated with more or less distinct *gurgling râles*. If the cavity be free from pus and have rather firm walls, the breathing is more *amphoric* in character.

Diagnosis. *Catarrhal bronchitis* has many points of resemblance to pneumonic phthisis. The subsequent course of the latter, with the high temperature, prostration, emaciation, sputa containing bacilli, and physical signs will prevent error.

Acute fibrinous and catarrhal pneumonia, often after a course of two or three weeks, show the bacilli and yet are not recognized as tuberculosis. It is a safe rule of practice to suspect tuberculosis and examine daily for the bacilli in all cases of pneumonia that show the least tendency to linger, and particularly where there are chills and a remittent temperature record.

Prognosis. *Acute* variety, the phthisis florida, usually terminates fatally within a few months.

The *subacute* and *chronic* varieties may, under judicious treatment and favorable hygienic conditions, be arrested, the caseous matter partly expectorated and partly absorbed, leaving more or less loss of

structure, cicatricial tissue supplying its place, which after a time contracts, causing more or less retraction of the chest walls.

Cases not properly treated, either from carelessness or poverty, succumb after a year or two.

TUBERCULAR PHTHISIS.

Synonyms. Tuberculosis; consumption; incipient phthisis; chronic phthisis; chronic ulcerative phthisis.

Definition. A chronic pulmonary disease caused by the bacillus tuberculosis, resulting in the deposition of tubercle in the lung structure, which in turn undergoes ulceration and softening which results in a septic infection, characterized by progressive failure of health, fever, cough, dyspnœa, emaciation, and exhaustion.

Causes. Hereditary and acquired susceptibility to the influence of the bacillus tuberculosis. It is questionable if an individual is born with pulmonary tuberculosis, but makes his advent with tissues that are a congenial soil for the growth and ravages of this wide-spread germ. Amongst the acquired causes are syphilis, alcoholism, chronic nephritis, certain occupations, and living in damp, overcrowded, dark, and badly ventilated locations. Debility following an attack of influenza predisposes to the deposition of tubercle.

Pathological Anatomy. Tubercle is a grayish-white, translucent, and semi-solid granulation, about the size of a millet-seed, most commonly deposited in the walls of the bronchioles, or around the small blood-vessels,—a peri-arteritis,—exciting a low form of inflammation, the result of its own death. The masses of tubercle soon undergo softening (cheesy transformation); the lung structure is secondarily affected, undergoing softening, which results in more or less destruction of the tissue, whence cavities are formed.

The inflammation may extend to the small arteries, causing hemorrhage.

The deposit of tubercle is generally at one of the apices, and "once present in an apex, the disease usually extends in time to the opposite upper lobe; but not, as a rule, until the lower lobe of the lung first affected has been attacked. Lesions of the base may be primary, though this is rare." Depositions may also occur in the brain, intestines, and liver.

The pleura is usually the seat of a chronic inflammation (dry pleurisy, tubercular), resulting in the obliteration of the pleural cavity.

Symptoms. The symptoms correspond closely to the stages of *deposition*, of *softening*, *septic infection*, and of the *formation of cavities*.

The development is *insidious*, with increasing *dyspepsia* and *anæmia*, the loss of appetite, distress after meals, and feeling of weakness, often misleading the patient and physician for some time until the occurrence of an *irritable heart*, a slight, dry, hacking *cough*, referred to the throat or stomach, scanty, glairy *expectoration*, gradual *loss of weight*, impaired muscular *strength*, *pallid appearance*, and a more or less copious *hæmoptysis*. *Pain*, sharp in character, below the clavicles, is often present. These symptoms are characteristic of the development of the disease.

The *beginning of softening* is announced by increased *cough*, freer *expectoration*, showing under the microscope the bacilli, *dyspnœa* increased on exertion, morning *chills*, evening *fever*, *night-sweats*—the so-called hectic fever, *diarrhœa*, increased *emaciation* and *weakness*, the patient, however, continuing very hopeful.

With the *formation of the cavities* the *cough* is more aggravated, with profuse and purulent *expectoration*, at times containing yellow striæ, the amount depending upon the number and size of the cavities; hæmoptysis is not common at this stage; the *pulse* rapid and weak, *increased hectic*, burning of the soles and palms, copious *night-sweats*, greater debility and *emaciation*, with *œdema* of the feet and ankles, denoting failure of the circulation, death soon following from asthenia, the mind clear and hopeful to the end.

Inspection. *First stage*, often shows slight *depressions* in the supra-clavicular, and at times in the infra-clavicular regions.

Palpation. *Second stage*, the *vocal fremitus* is slightly *increased* at both or either apex.

Percussion. *First stage*, *slight impairment* of the normal percussion resonance can sometimes be elicited at both or either apex. *Second stage*, the resonance is *impaired*, and may be even *dull*. *Third stage*, *dullness* with circumscribed spots of the *amphoric*, or *tympanitic* or *cracked-pot* sound.

Auscultation. *First stage*, *inspiration jerky*, *expiration prolonged*, the pitch higher than normal, the inspiration associated with *crackling râles* at both or either apex.

Second stage, vesico-bronchial breathing, associated with *sub-crepitant* and large and moist or *bubbling râles.*

Third stage, bronchial, broncho-cavernous, and *cavernous respiration,* associated with large and small moist or *bubbling,* and localized *gurgling* râles.

Bronchophony in its various degrees is associated with the second and third stages of tuberculosis.

Complications. Tubercular diseases of the brain, larynx, pleura, intestines, and peritoneum; perineal abscess leading to fistula, endocarditis, and myocarditis.

Diagnosis. The early diagnosis of tubercular phthisis rests mainly on the history, together with the symptoms and physical signs. In the first stage it is often mistaken for dyspepsia, anæmia, malarial fever, or disease of the heart; if the bacilli can be found in the sputum, the diagnosis is settled.

Prognosis. In the main unfavorable, although under proper treatment, change of climate, and like favorable conditions life may be prolonged for years.

FIBROID PHTHISIS.

Synonyms. Chronic interstitial pneumonia; cirrhosis of the lungs; Corrigan's disease.

Definition. A hyperplasia (thickening) of the pulmonary connective tissue, resulting in atrophy and degeneration of the vesicular structure, associated with bronchial inflammation; characterized by cough, profuse expectoration containing the bacillus tuberculosis, fever, emaciation, and ultimately death by asthenia.

Causes. Hereditary predisposition; inhalation of irritants and associated with certain occupations, such as stone cutting, grinding, etc. Following lobar pneumonia; chronic bronchitis; alcoholism; syphilis; chronic nephritis.

Pathological Anatomy. In addition to the pneumonic changes in the lung structure, there is developed a reparative or fibrous process resulting in thickening of the bronchial mucous membrane and dilatation of the air tubes. Hyperplasia of the pulmonary connective tissue, resulting in the compression and consequent destruction of the vesicular structure, which is assisted by the contraction of the newly

formed tissues. Sooner or later catarrhal pneumonia results, the product undergoing the cheesy degeneration, cavities being formed, and as a result of the long-continued suppuration, tubercular depositions occur, hastening the destruction of the lung tissue.

Prof. Da Costa has reported a number of cases of "grinders' phthisis," in whose sputum was found the "bacillus tuberculosis," and in whose family history there were no traces of consumption.

Symptoms. The course is chronic, beginning as a *bronchial catarrh*, worse in winter, better in summer, when, after several years, the *cough* becomes more *continuous*, the *expectoration* freer and muco-purulent, containing the bacilli tuberculosis in large numbers. Gradually *hectic fever* develops, with *night-sweats*, *dyspnœa*, and rapid *emaciation*, soon followed by *œdema* of the feet and ankles, the result of failing circulation, death occurring by asthenia.

Inspection. Depression of the chest walls.

Percussion. *Impaired* resonance, followed by *dullness*, with irregular spots of amphoric or *tympanitic* percussion note over the points of depression.

Auscultation. *First stage*, *vesiculo-bronchial*, or harsh respiration, associated with large and small moist or *bubbling*, *râles*, followed by *bronchial*, *broncho-cavernous*, and *cavernous* respiration, with circumscribed *gurgling* râles.

Diagnosis. Beginning as a bronchial catarrh, slowly progressing, with the remission of the symptoms during the summer months, finally becoming progressively worse, the discovery of the bacilli in the sputum, with the formation of cavities, and symptoms of asthenia, are the chief points in the diagnosis.

Prognosis. The duration of fibroid phthisis is most protracted, six to twelve years being the average duration; death, however, is the inevitable termination.

Prof. Da Costa has records of one hundred deaths from "grinders' consumption" whose average life was twelve years from the development of the signs of the disease.

TREATMENT OF PULMONARY TUBERCULOSIS.

Can pulmonary tuberculosis be prevented? To a great extent, yes, as in a large proportion of cases the *infection* of the system is the result of *contagion* or the ingestion of food containing the germs in those having the inherited or acquired phthisical diathesis. It is

now known that tuberculosis is very common in the cattle whose flesh forms so large a portion of the food of man. Were it not for the protection given by cooking, the history of this disease would be a sadder one than it is. But the milk is not often cooked. May not the great increase in tuberculosis be caused by the use of cows' milk?

The bacilli once found in the sputum, can the unfortunate host be cured?

While I have never seen a case of marked incipient phthisis cured, in the broad acceptation of the term, I have repeatedly seen life prolonged for a number of years, and the deposition of tubercle long delayed by a change of climate early in the history of the case, warm clothing, life and exercise in the open air short of fatigue, and systematic bathing with a nutritious plan of dieting. If the diet is arranged in accordance with the appetite, the latter will gradually increase, but should it not, it may be stimulated by such bitters as *strychninæ sulphas*, *nux vomica*, *ignatia amara*, *colombo*, or *gentian*.

For a number of years I have been in the practice of placing incipient cases of tuberculosis upon what I term "up and down" doses of *strychninæ sulphas*, and often with a success that is amazing. A formula is given of—

℞. Strychninæ sulph., ... gr. iv .26 Gm.
Aq. chloroformi, vel
Ess. pepsini, ... f℥ij 60. Cc. M.
Sig.—Ten minims equal gr. $\frac{1}{24}$ (0.0025 Gm.).

Mode of using: Five drops three times daily for one week, then ten drops three times daily for a week, then fifteen drops three times daily for a week, then twenty drops three times daily for a week, then fifteen drops, then ten drops, then five drops, and so on week after week for months and years.

The symptoms are to be met as they arise, and drugs are not to be used simply because the patient has the physical signs of beginning phthisis. For the general debility and malaise that accompanies the early stages of the malady, any one or a combination of the following drugs, exercising care that they in no way interfere with the appetite: *Guaiacol*, ♏iij–v (0.2–0.3 Cc.) for adults, and ♏ij–iij (0.12–0.2 Cc.) for children, four times daily, in either sweetened water, milk, or meat broth, or wine; *oleum morrhuæ*, *ferri iodidum*, *hypophos-*

phites, strychninæ arsenias, gr. $\frac{1}{60}$–$\frac{1}{80}$ (0.001–0.002 Gm.) after meals, or a combination of *arsenicum* and *digitalis :*

℞. Acidi arseniosi, ... gr. j .065 Gm.
Digitalini (Merck's), ... gr. j .065 Gm. M.
Ft. pil. No. xxx.
Sig.—One after meals.

For the cough and expectoration, *creosote*, ♏j (0.06 Cc.) in milk, water, or whiskey three times daily, gradually increasing the dose a minim a day until stomach toleration.

In the *pneumonic variety* the attempt should always be made to remove the caseous matter by absorption and expectoration. The following prescriptions will sometimes prove successful :

℞. Ammonii carb., ... gr. v .3 Gm.
Ammonii iodidi, ... gr. v–x .3–.6 Gm.
Aq. chloroformi, ... f℥ij 8. Cc.
Syr. prun. virg., ... f℥ij 8. Cc. M.
Every five hours, diluted, alternating with

Liq. potassii arsenitis, ... ♏v .3 Cc.
Mass. ferri carb., ... gr. v .3 Gm.
Vini xerici, ... f℥j 4. Cc.
Aquæ, ... q. s. ad f℥ss 15. Cc. M.

In the tubercular variety the early *dyspeptic* symptoms are wonderfully relieved by the following :

℞. Pepsini cryst., ... gr. ij .13 Gm.
Acidi hydrochlorici dil., ... ♏xv 1. Cc.
Glycerini, ... ♏xx 1.3 Cc.
Succi limonis, ... ♏xv 1. Cc.
Aquæ aurantii flor., ... ad f℥ij ad 8. Cc. M.
Sig.—With meals, diluted.

It is in this variety of consumption that every means should be employed to improve the general health. Improvement may often follow the long-continued moderate use of alcoholic stimulants, the amount being only such as will increase the appetite and improve the digestion. If rise of temperature, flushed face, or dyspeptic symptoms occur, discontinue the stimulants at once. Be sure of the diagnosis before resorting to alcohol.

For the fibroid variety, to prevent the hyperplasia of the connective tissue, *hydrargyri corrosivum chloridum, potassii iodidum*, or *aurii et sodii chloridum*, are recommended. *Oleum morrhuæ* is of benefit.

For the *gastric symptoms*, which are often so severe as to seriously interfere with assimilation, either *bismuthum*, gr. xx (1.3 Gm.) before meals, or *arsenicum :*

℞. Liquor. potassii arsenitis, . . . ♏xxx 2. Cc.
Tincturæ nucis vomicæ, . . . f℥j 4. Cc.
Aquæ chloroformi, ... ad f℥ij ad 60. Cc. M.
SIG.—Teaspoonful before meals, diluted.

For the *fever*, unfortunately, but little can be accomplished with drugs. If, however, it exceeds 101° F., an attempt should be made to reduce it.

The "Niemeyer pill" is usually recommended, its formula being—

℞. Quininæ sulph., ... gr. j .065 Gm.
Pulv. digitalis, ... gr. ss .032 Gm.
Pulv. opii, ... gr. ¼ .016 Gm.
Pulv. ipecac., ... gr. ¼ .016 Gm.

From a very considerable experience with this "famous" pill, I can recall few cases in which it has proven of the least benefit. The following is much more effectual:

℞. Quininæ sulph., ... gr. x .6 Gm.
Quininæ muriat., ... gr. x .6 Gm.
Pulv. opii et ipecac., ... gr. iij .2 Gm.
Ft. capsul. No. ij.
SIG.—One capsule five hours and the other three hours before the decided rise of temperature.

In a few instances the temperature has been favorably influenced by *antifebrin*, gr. v (0.3 Gm.), in tablets, at one, three, and five o'clock each afternoon, or *acetanilidum*, gr. v (0.3 Gm.), at the same hours. If sweating occur, add to each five-grain tablet *agaricin*, gr. $\frac{1}{30}$ (0.002 Gm.). Many patients prefer cool sponging, adding alcohol, vinegar, or bay-rum to the water, and there is no doubt that sponging will promptly reduce the temperature two or three degrees.

For the *cough* the following may give relief:

℞. Codeinæ sulphat., ... gr. ⅓–½ .022–.032 Gm.
Acidi hydrocyanici dil., ... ♏ij .12 Cc.
Syr. tolu, ... f℥j 4. Cc. M.
SIG.—Several times a day.

Or—

℞. Codeinæ, ... gr. iv .26 Gm.
Acid. hydrochlor. dil., ... f℥ss 2. Cc.
Spirit. chloroformi, ... f℥iss 6. Cc.
Syr. limonis, ... f℥j 30. Cc.
Aq. lauro-cerasi, ... ad f℥iv ad 120. Cc. M.
Sig.—A teaspoonful, repeated when cough is troublesome.

If *diarrhœa* develop, *bismuthum*, gr. xx–xxx (1.3–2 Gm.) every three or four hours, with rest in bed and mustard to the abdomen; or ℞. Cupri sulphat., gr. iss (0.1 Gm.); ext. nucis vomicæ, gr. iij (0.2 Gm.); pulv. opii, gr. vj (0.4 Gm.). M. et ft. pil. No. xij. Sig.—One every three or four hours; or ℞. Liquor. potassii arsenitis, ♏xxx (2 Cc.); tincturæ opii deodorat., f℥iss (6 Cc.); liquor pepsini, ad f℥ij (60 Cc.). M. Sig.—Teaspoonful at meal-time.

For *night-sweats*, *atropinæ sulphas*, gr. $\frac{1}{60}$ (0.001 Gm.) at bed-time, or *agaricin*, gr. $\frac{1}{20}$–$\frac{1}{10}$ (0.003–0.006 Gm.) at bed-time, adding small doses of morphina if it cause loose stools. *Camphoric acid*, gr. xx–xxx (1.3–2 Gm.), about two hours before the expected sweat, the time of administration is important, as the drug is rapidly eliminated and it has the additional advantage of causing no ill or disagreeable effect. It is best given dry on the tongue, or in cachets. It is claimed that *sulphonal*, gr. v–x (0.3–0.6 Gm.), at bed-time, controls the night-sweats and also produces a quiet, refreshing sleep.

For *hæmoptysis* no one remedy is comparable with *atropinæ sulphas*, gr. $\frac{1}{200}$–$\frac{1}{100}$–$\frac{1}{60}$ (0.00032–0.00065–0.001 Gm.), repeated pro re nata; or *nitro-glycerinum*, one per cent. solution, ♏j (0.06 Cc.), every fifteen minutes for a few doses, often acts promptly.

Beginning in December, 1890, a large number of cases of incipient tuberculosis were treated in the wards of the Philadelphia Hospital with Koch's *tuberculin*. The treatment was negative in every case. In the fall of 1892 ten cases of early tuberculosis were placed under treatment with Kleb's *tuberculocidin*. Its action is different from Koch's tuberculin in that it never excites the febrile reaction of the latter. The results were also negative, although for several months the patients seemed free from the bacillus.

The diet must be of the most nutritious and easily digestible character. If *oleum morrhuæ* or *petrolatum* can be assimilated, either should be used for a long time. The hygiene of the patient is of the utmost importance, and, as it is a struggle for life, no means should be left untried to gain the victory.

DISEASES OF THE PLEURA.

PLEURITIS.

Synonyms. Pleurisy; "stitch in the side."

Definition. A fibrinous inflammation of the pleura, either *acute*, *subacute*, or *chronic* in character, occurring either idiopathically or secondarily; characterized by a sharp pain in the side, a dry cough, dyspnœa, and fever. It may be limited to a part, or may involve the whole of one or both pleural membranes.

Causes. *Idiopathic* pleuritis is said to be due to cold and exposure, to injuries of the chest walls, or the result of muscular exertion. Tuberculosis is the cause in a few instances.

Secondary pleuritis occurs during an attack of pneumonia, pericarditis, rheumatism, variola, scarlatina, measles, Bright's disease, tuberculosis, or puerperal fever.

Chronic pleuritis follows an acute attack, or is the result of tuberculosis, Bright's disease, cancer, or alcoholism.

Pathological Anatomy. The ordinary course pursued by an inflammation of a serous membrane is *hyperæmia* followed by *exudation of lymph*, the *effusion of fluid*, its *absorption*, and the *adhesion* of the membranes.

The *first* or *dry stage* of pleuritis is a hyperæmia or diffused irregular redness of the membrane, with little specks of exudation. The *second stage* is characterized by the copious exudation of lymph, more or less completely covering the membrane, giving it a dull, cloudy, or shaggy appearance. If the inflammation ceases at this point, it is termed *dry pleuritis*. The *third*, or stage of effusion, is characterized by the pouring out of a semi-fibrinous liquid, more or less completely filling and distending the pleural cavity, and floating in the fluid are fibrinous flocculi, blood, and epithelial cells.

Absorption of the fluid and more or less of the exudative lymph soon occurs, the unabsorbed portion becoming organized, forming adhesions which obliterate the pleural cavity.

The effusion, if on the right side, pushes the heart farther to the left; if on the left side, the heart is displaced to the right, the impulse

often being seen to the right of the sternum. The lungs are also compressed and displaced upward and against the spinal column, and, on removal of the fluid, expand again, except in cases of chronic pleuritis, when the functional activity of the pulmonary structure is more or less permanently impaired.

Chronic pleuritis results when the fluid is not absorbed or when it is effused into the cavity in a slow and insidious manner. The membrane is irregularly thickened, with firm adhesions, fluid being found in the meshes; depressions of the thoracic walls also occur. The fluid may be serum, pus (*empyema*), or pus and blood. Openings may form, through which there is permanent discharge, either externally (fistulous empyema) or into the bronchi, or, rarely, into the bowels.

Symptoms. *Acute variety:* Begins with a *chill*, followed by a *sharp*, lancinating *pain* (stitch) near the nipple or in the axilla, aggravated by coughing and breathing, associated with slight *tenderness on pressure*. The *respirations* are *rapid* and shallow, 30–35 per minute; a short, dry, hacking *cough;* moderate *fever;* compressible pulse, 90–120. With the effusion of liquid the *dyspnœa* becomes aggravated, the *cough* more distressing, the *cardiac action* embarrassed, the *countenance* wearing an anxious expression, the patient usually lying on the affected side. With the absorption of the fluid the symptoms gradually ameliorate, convalescence being more or less rapid.

Subacute variety: Begins insidiously after cold, exposure, and fatigue in those enfeebled. Patients usually complain of a *sense of weariness*, *shortness of breath*, aggravated on exertion, evening *fever*, followed by *night-sweats*, short harassing *cough*, none or very scanty sputum; the *pulse* is small, feeble, but frequent, 100–120 beats per minute. The characteristic pain in the side is usually wanting.

Chronic variety: Irregular chills, fever, night-sweats, dyspnœa, palpitation, embarrassed circulation, with more or less prostration.

Inspection. *First stage*, deficient movement of the affected side, on account of the pain induced by full breathing.

Second stage, bulging or fullness of the affected side, with obliteration of the intercostal spaces and displacement of the cardiac impulse.

Palpation. *Second stage*, vocal *fremitus* feeble or absent over the site of the effusion, exaggerated *above* the site of the fluid. Rarely, *fluctuation* may be obtained.

Percussion. *First stage;* may be slightly *impaired.*

Second stage; dullness or even flatness over the site of the effusion; *tympanitic* percussion note above the fluid.

Auscultation. *First stage;* feeble vesicular murmur over the affected side, the patient breathing superficially, to prevent the pain; a *friction* sound, slight and grating or creaking, becoming louder as the exudation of lymph increases, limited usually to the angle of the scapula of the affected side, rarely heard over the entire side, accompanies the respiratory movements.

Second stage; feeble or absent vesicular murmur on the affected side, depending upon partial or complete compression of the lungs by the fluid. Above the fluid puerile breathing, and just at the upper margin of the fluid a friction sound may be heard.

The *vocal resonance* is diminished or absent over the site of the fluid and markedly increased above, *ægophony* being present at the upper margin of the fluid.

With the absorption of the fluid the vesicular murmur gradually returns, associated with a moist friction sound.

Diagnosis. *Acute pneumonia* is often mistaken for the effusion stage of pleurisy. The points of distinction are: in pneumonia there is the pronounced chill, high fever, and characteristic sputa, bronchial breathing, exaggerated vocal fremitus and resonance, and no displacement of the heart, the reverse occurring in pleurisy.

Enlargement of the liver may be mistaken for pleurisy with effusion, the chief point of distinction being that, in enlargement of the liver, the superior line of dullness is depressed upon full inspiration, while in pleurisy with effusion inspiration does not modify the location of the dullness.

Prognosis. *Idiopathic* pleurisy usually terminates in recovery within three weeks. Pleurisy the result of constitutional causes has its prognosis modified by the condition with which it is associated. *Empyema*, unless the result of a diathesis, terminates favorably. *Double pleurisy is unfavorable.* The etiological factor of tuberculosis must always be borne in mind in making a prognosis in pleurisy, whether acute or chronic.

Treatment. At the onset, in plethoric patients, *wet cups* over the affected side; if great dyspnœa, severe pain, and high arterial tension, even *venesection*, and in anæmic or weak persons, *dry cups*, following the use of either wet or dry cups with poultices or turpentine

stupes. The severe pain is promptly relieved by the hypodermic injection of *morphinæ sulphas*, over its site, repeated as indicated, or the frequent use of small doses of *pulvis ipecacuanhæ et opii*.

In the very early stages of pleurisy the disease may be cut short by *sodii salicylas*, gr. xv–xx (1–1.3 Gm.), well diluted every three or four hours. In the stage of effusion excellent results follow the use of the *salicylates*.

After effusion has begun, *extractum pilocarpi fluidum*, ♏xv (1 Cc.), every two or three hours, or in drachm doses every other day for a week or two, after which twice weekly; or—

℞. Potassii acetat., ... gr. xxx 2. Gm.
Infus. digitalis, ... f℥ij 8. Cc. M.
Every three or four hours.

Bowditch, of Boston, for years has advocated early aspiration in pleural effusion. If after three or four days no impression is made on the effusion by drugs, aspiration should be employed and tablespoonful doses of *liquor ferri et ammonii acetatis* (*Basham's mixture*) administered every four hours, and an early morning dose of *magnesii sulphas*, ℥ss–j (15–30 Gm.) well diluted.

The effusion of pleuritis is rapidly removed by the method of treatment suggested by Prof. Matthew Hay, of Scotland, consisting in the use of a concentrated solution of saline cathartics: "Order the patient to take nothing after the evening meal, and then an hour or so before breakfast the salt is given dissolved in as little water as possible. Usual dose from ℥iv–vj (15–24 Gm.) to ℥j–ij (30–60 Gm.) *magnesii sulphatis* to an ounce or two of water, no fluids to be used after the dose; this usually produces from four to eight watery stools, without pain or discomfort, and also acts as a diuretic."

The essence of the "Hay method" consists in getting the concentrated solution into the intestines at a time when the fluid contents are scanty.

If the effusion is uninfluenced by the above-named means, use *potassii iodidum*, gr. xv (1 Gm.), every four hours, well diluted, with flying *blisters* over the affected side, or *unguentum hydrargyri* in the arm-pits, groins, and over the site of the effusion.

In *double pleuritic effusion*, evacuate the fluid at once with the *aspirator*, and use the potassium and digitalis mixture mentioned above.

Chronic pleurisy. If the effusion be still serous, it is often absorbed

by the internal use of *potassii iodidum*, alternating with "*Basham's mixture*," and *blisters*, the secretions being watched. If, however, the liquid is pus (*empyema*), the *aspirator* should be used at once, the patient placed upon "*Basham's mixture*," *stimulants*, and *quininæ hydrochloras*.

Usually, however, within a very few days after aspiration, another accumulation of pus will have taken place. Should this occur, the purulent pleurisy should then be treated as an abscess, an incision being made between the fifth and sixth ribs, the pus evacuated, a drainage-tube introduced, and an antiseptic dressing applied. If the tendency to pus secretion still remains, the pleural cavity must be washed out with an antiseptic solution, the constitutional treatment being continued.

HYDROTHORAX.

Synonym. Dropsy of the pleura.

Definition. The effusion of fluid into the pleural cavities (bilateral), the result of a general dropsy from renal or cardiac disease.

Pathological Anatomy. More or less clear serous fluid in both pleural sacs, compressing the lung. No signs of inflammation are present.

Symptoms. Following dropsy of the abdomen occurs *dyspnœa*, with signs of deficient blood aëration, both lungs being compressed.

Palpation. Absent vocal fremitus over the site of the fluid.

Percussion. Dullness over the site of the fluid.

Auscultation. Absent vesicular murmur over the site of the fluid.

Diagnosis. Easily determined by association of the symptoms with a general dropsy.

Prognosis. Controlled by the cause producing the general dropsy.

Treatment. Depending upon the condition causing the dropsy. *Dry cups* over the chest afford relief. If the symptoms of non-aëration of the blood are severe, the fluid should be at once evacuated with the *aspirator*.

PNEUMOTHORAX.

Synonyms. Air in the pleural cavity; hydropneumothorax.

Definition. The accumulation of air in the pleural cavities, with the consequent development of inflammation of the membranes;

characterized by sharp pain, followed by rapidly developing dyspnœa and cough.

Causes. Generally the result of tuberculosis, causing perforation of the pleura. Perforation may take place from the pleura into the lung, in connection with empyema or abscess of the chest wall. Direct perforation from without, by laceration of a fractured rib or severe contusion.

Pathological Anatomy. The gas in the pleural cavity consists of oxygen, carbon anhydride, and nitrogen in variable proportions. It may fill the pleural sac completely, compressing the lung, or is sometimes limited by adhesions. The gas tends to excite inflammation, the resulting effusion being either serous or purulent.

Symptoms. Symptoms of pneumothorax, the result of perforation, are *sudden or sharp pain* in the side, *intense dyspnœa*, attended with symptoms of *collapse*, coldness of the surface, and cold sweats.

The above symptoms, in many instances, follow a severe or violent paroxysm of *coughing*. In severe cases there is never a moment's cessation of the acute pain and distressing dyspnœa, causing orthopnœa from the onset until death.

Inspection. Enlargement of the affected side, the intercostal spaces being widened and effaced or even bulged out so that the surface of the chest is smooth. Respiratory movements of the affected side are diminished or absent.

Percussion. Immediately after the rupture the percussion note is hyper-resonant, or even tympanitic or amphoric in quality. If the amount of air in the pleural cavity becomes extreme, there is dullness on percussion, associated with a feeling of great resistance or density. When effusion of blood occurs, dullness is observed over the lower part of the chest, hyper-resonant or tympanitic percussion note over the upper portions of the chest, these sounds changing as the patient changes position.

Auscultation. The normal vesicular murmur may be diminished or absent. The typical amphoric respiratory sound is heard when the fistula is open, usually associated with a metallic echo.

Metallic tinkling, or the bell sound, is sometimes distinctly produced by breathing, coughing, or speaking, after the development of inflammation of the pleura.

The vocal resonance may be diminished or absent, or, rarely, it may be exaggerated, with a distinct metallic echo.

After the development of inflammation in the pleura, suddenly shaking the patient gives rise to a *splashing sensation*, the succussion sound, if both air and fluid are present in the pleural cavity.

Prognosis. When occurring as the result of tuberculosis, the prognosis is extremely unfavorable; rarely, the fistulous opening is closed by inflammatory action; the case then becomes one of chronic pleurisy.

Treatment. At once a hypodermic injection of *morphinæ sulphas*, which relieves the severe pain and somewhat modifies the distressing dyspnœa, followed by the evacuation of the fluid and air with the *aspirator*.

If the fistulous opening be closed by inflammatory action, the case resolves itself into one of chronic pleurisy, the treatment indicated for that affection plus the treatment of tuberculosis, being the indication.

DISEASES OF THE CIRCULATORY SYSTEM.

The methods employed in making a physical examination of the heart are: I. *Inspection*. II. *Palpation*. III. *Percussion*. IV. *Auscultation*.

Inspection indicates the exact point of the *cardiac impulse*, and the presence or absence of any abnormal *pulsations* or any *change* in the form of the *præcordium*.

Normally the *impulse* is visible only in the *fifth interspace*, midway between the left nipple and the left border of the sternum, its area covering about one square inch, most distinct in the thin, while often barely seen in the very fleshy; often displaced downward by full inspiration and elevated by complete expiration.

Disease may alter the *position* and *area* of the impulse.

The *position* of the impulse is moved to the right by left pleuritic effusions; downward by cardiac hypertrophy or pulmonary emphysema; upward by a pericardial effusion.

The *area* of the impulse is changed and enlarged by pericardial adhesions, cardiac dilatation or hypertrophy.

Palpation confirms the observations of inspection, and also determines the *force*, *frequency*, and *regularity* of the *cardiac impulse*.

The force of the *impulse* is *diminished* by cardiac dilatation, fatty and fibroid degenerations of the heart, emphysema, pericardial effusion, and adynamic diseases.

The *impulse* is *increased* by cardiac hypertrophy, during the first stage of endocarditis and pericarditis, functional cardiac disturbances, and sthenic inflammations.

Percussion will determine the boundaries of the *superficial* and *deep cardiac space*, the so-called *præcordium*. It is essential that the upper, lower, and two lateral boundaries of the pericardial region be memorized, to wit: *superior boundary*, the upper edge of the third rib; *the lower boundary* is a horizontal line passing through the fifth intercostal space; the *left lateral boundary* is about or a little within a vertical line passing through the nipple, the *linea mammalis;* and the *right lateral boundary* is an imaginary vertical line situated one-half an inch to the right of the sternum. These boundaries vary somewhat in health, but are sufficiently accurate for all practical purposes.

The superficial cardiac space represents that portion of the heart uncovered with lung; it is triangular in form, its apex being the junction of the lower border of the left third rib with the sternum, its area not exceeding two inches in any direction.

The superficial space is *increased* by cardiac hypertrophy, dilatation, or pericardial effusion.

Diminished at the end of full inspiration or by emphysema.

The deep cardiac space represents that portion of the heart covered by lung, and extends from the upper border of the third rib to the lower edge of the fifth interspace, and from half an inch to the right of the sternum to near the left nipple.

It is *increased* by hypertrophy or dilatation of the heart, left pleuritic effusion, and apparently increased by consolidation of the anterior border of the investing lung.

Auscultation indicates the character of the normal cardiac sounds and the point at which they are heard with greatest intensity, and should be thoroughly familiarized if abnormal sounds are to be fully appreciated.

The ear or stethoscope applied to the præcordium distinguishes in health *two sounds*, separated by a momentary silence—*the short pause*, and the second sound followed by an interval of silence—*the long pause*.

The first sound, corresponding to the contraction of the heart—the *systole*—is louder, longer, and of a lower pitch and a more booming quality than the second sound, and has its point of greatest intensity at the cardiac apex or a little to the left. It corresponds closely in time to the pulsations as felt in the carotid or radial arteries.

The second sound is shorter, weaker, and higher in pitch than the first sound, and has a clicking or valvular quality, having its point of greatest intensity at the second right costal cartilage and a little above, and corresponds to the closure of the aortic and pulmonary valves. The sound made by the closure of the tricuspid valves is best isolated at the ensiform cartilage; the sound made by the closure of the pulmonary valves, at the third left costal cartilage.

The following table, giving the phenomena and time of normal cardiac movements, will assist in recalling the physiology of the heart:

	Action of Heart.	Sound and Pause.	Time in One-tenths of the Heart's Beats.
Systole of the heart, or ventricular systole.	Ventricles contracting, auricles dilating. Auriculo-ventricular valves (mitral and tricuspid) suddenly close and remain closed during the whole time of the first sound. Semilunar valves (aortic and pulmonary) open; movement or locomotion of heart causing the impulse or apex beat. Blood rushes out from the ventricles into aorta and pulmonary artery, and *dilates* these vessels and their extensions (arterial system). Blood flows slowly into the auricles from the vena cava and pulmonary veins. The *pulse* felt in different arteries from one-thirtieth to one-eighth of a second later than impulse.	First cardiac sound (systolic) dull and prolonged.	About four-tenths of the heart's beats, or twenty-four-sixtieths of a second.

	Action of Heart.	Sound and Pause.	Time in One-tenths of the Heart's Beats.
Diastole of the heart, or ventricular diastole.	Ventricles dilating and receiving blood from auricles. Auricles dilating and receiving blood from veins. Auriculo-ventricular valves (mitral and tricuspid) open. *Dilated* pulmonary artery and aorta recoil and suddenly close the semilunar valves (aortic and pulmonic), which remain closed during the whole of the second sound and the interval of silence.	Second cardiac sound (diastole) short and sharp.	About three-tenths of the heart's beats, or eighteen-sixtieths of a second.
	Ventricles and auricles still continue to dilate—viz., receive blood. Near the close of this period the auricles, being fully dilated (filled with blood), suddenly contract and complete the dilatation of the ventricles.	Period of silence or rest.	About three-tenths of the heart's beats, or eighteen-sixtieths of a second.

The extent of surface over which the cardiac sounds are heard varies, according to the size of the heart and the condition of the adjacent organs for transmitting sounds.

The cardiac sounds may be altered in *intensity*, *quality*, *pitch*, *seat*, and *rhythm*, or they may be accompanied, preceded, or followed by adventitious or new sounds, the so-called *endocardial or cardiac murmurs*.

The intensity is increased by cardiac hypertrophy, irritability of the heart, or consolidation of adjacent lung structure.

The intensity is diminished by cardiac dilatation or degeneration, during the course of adynamic fevers, emphysematous lung overlapping the heart, or pericardial effusion.

The quality and pitch of the first sound may be sharp or short and of higher pitch when the ventricular walls are thin, or have undergone beginning fibroid change, the valves being normal ; its pitch

and quality are also raised during the course of low fevers. The second sound becomes duller and lower in pitch when the elasticity of the aorta is diminished or the aortic valves thickened. Either or both sounds have a more or less metallic quality in irritable heart and during gaseous distention of the stomach.

The seat of greatest intensity of the cardiac sounds is changed by displacement of the heart, pleuritic effusion, pericardial effusion, and abdominal tympanites.

The rhythm is often interrupted by a sudden pause or silence, the heart missing a beat, or the sounds are irregular, confused, and tumultuous, the result of organic changes in the cardiac muscle, valves, orifices, or vessels; or a reduplication of one or both sounds of the heart may occur.

The *adventitious cardiac sounds or murmurs* are of two kinds: those made external to the heart, as *pericardial*, exocardial, or frictional murmurs, and those made within the cardiac cavity, *endocardial murmurs*.

Pericardial murmurs, or friction sounds, are made by the rubbing upon one another of the roughened surfaces of the pericardial membrane during the early stages of inflammation. The sounds have a rubbing, creaking, or grating character, and are differentiated from a pleural friction sound by their being limited to the præcordium, synchronous with every sound of the heart, and not influenced by respiration.

They are distinguished from an endocardial murmur by their superficial rubbing, creaking, or grating character, and by not being transmitted beyond the limits of the heart, either along the course of the vessels, or to the left axilla or back.

Endocardial murmurs are of two kinds—to wit: *organic* and *functional*.

Functional endocardial or blood murmurs are the result of changes in the normal constituents of the blood.

Their character is soft, they are heard most distinctly at the base to the left of the sternum, during the systole, are not transmitted beyond the limits of the heart, either to the left axilla or the back, and they are associated with general anæmia.

Organic endocardial murmurs are produced by blood currents pursuing either a *normal* or an *abnormal* direction.

In health there are *two direct blood currents* upon each side of the

heart—to wit: the current from the left auricle to the left ventricle, the *mitral direct current;* the current from the left ventricle to the aorta, *the aortic direct current;* the current from the right auricle to the right ventricle, the *tricuspid direct current;* and the current from the right ventricle to the pulmonary artery, the *pulmonic direct current.*

When, from disease, the valves are not properly closed, the blood is allowed to flow back against the direct current, producing abnormal blood currents—to wit: when the mitral valve is incompetent, the blood flows from the left ventricle back into the left auricle during the cardiac systole, producing the *mitral regurgitant or indirect current;* when the aortic valves are incompetent, the blood is permitted to flow from the aorta into the left ventricle during the cardiac diastole, producing the *aortic regurgitant or indirect current;* when the tricuspid valves are incompetent, the blood flows from the right ventricle back into the right auricle during the systole, producing the *tricuspid regurgitant or indirect current;* when the pulmonary valves are incompetent, the blood flows from the pulmonary artery into the right ventricle, producing the *pulmonic regurgitant or indirect current.*

The mitral direct current occurs during the contraction of the left auricle, or just *before* the first sound of the heart and immediately *after* its second sound. *The aortic direct current* is produced by the contraction of the left ventricle, and occurs with the first sound of the heart. *The tricuspid direct current* occurs during the contraction of the right auricle, or just before the first or immediately after the second sound. The pulmonic direct current is produced by the contraction of the right ventricle, occurring during the first cardiac sound.

The mitral direct or presystolic murmur occurs *before* the first sound of the heart and immediately *after* the second sound. It is caused by a narrowing of the mitral orifice, has a blubbering quality, well imitated by throwing the lips into vibration by the breath, of a low pitch, and it has its seat of greatest intensity at the cardiac apex, and is not transmitted to the left axilla or to the base of the heart.

The mitral regurgitant or systolic murmur occurs with the first sound of the heart, resulting from the failure of the mitral valves to close the mitral orifice during the systole, in consequence of which the blood flows back, or regurgitates into the left auricle. It is usually of a blowing or churning character, and has its seat of greatest intensity at the cardiac apex, being well transmitted to the left axilla and inferior angle of the left scapula.

The aortic direct murmur occurs with the first sound of the heart. It is caused by a narrowing of the aortic orifice, has a rough or creaking character, is of high pitch, having its seat of greatest intensity in the second intercostal space, to the right of the sternum, and is well transmitted over the carotid artery.

The aortic regurgitant murmur occurs with the second sound of the heart, and is caused by the failure of the aortic valves to close the aortic orifice during the diastole, permitting the blood to flow back or regurgitate into the left ventricle. It is usually of a blowing or churning character and of low pitch, having its seat of greatest intensity over the base of the heart, and is well transmitted downward toward or below the cardiac apex. It is the only organic murmur heard in the left side of the heart which occurs with the second sound of the heart.

The tricuspid direct murmur occurs before the first sound of the heart and immediately after the second sound. It is caused by a narrowing of the tricuspid orifice, has a blubbering quality, and is low in pitch, having its seat of greatest intensity near the ensiform cartilage. This murmur is exceedingly rare.

The tricuspid regurgitant murmur occurs with the first sound of the heart, the result of the failure of the tricuspid valves to close the tricuspid orifice during the systole, thus allowing the blood to flow back or regurgitate into the right auricle. It is usually of a blowing or soft, churning character, having its seat of greatest intensity at the ensiform cartilage. This murmer is also very infrequent, and occurs mostly when the right ventricle is considerably dilated, and without the existence of any valvular disease.

The pulmonic direct murmur occurs with the first sound of the heart. It is generally connected with congenital lesions. It occurs at the same instant that the aortic direct murmur occurs, and is distinguished from the latter by its not being transmitted into the carotid artery, whereas the aortic direct murmur is always thus transmitted.

The pulmonary regurgitant murmur occurs, like the aortic regurgitant murmur, with the second sound of the heart. This murmur is exceedingly rare, and its presence is only positively differentiated from the aortic regurgitant murmur by the absence of aortic lesions and symptoms.

ACUTE PERICARDITIS.

Definition. An acute fibrinous inflammation of the pericardium; characterized by slight fever, pain, præcordial distress, and disturbed cardiac action and circulation.

If the inflammation be limited to the parietal or visceral layer, or to a part of either, it is termed *partial* or *circumscribed* pericarditis; if it involve the whole of both surfaces, it is termed *general* or *diffused* pericarditis.

The inflammation may be primary or secondary.

Causes. Primary pericarditis resulting directly from cold and exposure or injuries is rare.

Secondary pericarditis follows, or is associated with, rheumatism, influenza, scarlatina, variola, puerperal fever, tuberculosis, septicæmia, Bright's disease, gout, scurvy, and diabetes.

It is frequently associated with pneumonia and pleuro-pneumonia, particularly in alcoholics.

Pathological Anatomy. The same as of serous membranes in other situations. The morbid changes may be seen as (1) acute plastic or dry pericarditis (frequently tubercular); (2) pericarditis with effusion, sero-fibrinous, hemorrhagic, or purulent.

Hyperæmia of the membrane, most marked on the visceral layer, followed by the exudation of lymph scattered in irregular patches, giving it a rough and shaggy appearance (*dry pericarditis*), followed by the effusion of a sero-fibrinous fluid, with flocculi floating in it, and at times mixed with blood. Rarely, the fluid is purulent.

The fluid and lymph undergo absorption with resulting adhesions identical with those described under pleurisy.

Symptoms. Acute pericarditis may be well marked and still present none of the characteristic subjective symptoms. It usually begins with *rigors*, *fever* of the remittent type, frequently *nausea* and *vomiting*, *præcordial distress* and tenderness, *acute* shooting *pains*, increased by breathing and coughing; dry, suppressed *cough*; *increased cardiac action*, and sometimes violent palpitation. An attack of pericarditis secondary to an existing disease presents no marked symptoms other than those mentioned to indicate its onset. Attacks of nausea and vomiting occurring during the course of rheumatism, pneumonia, pleurisy, and nephritis should call attention to the heart. Duration of this early stage, from a few hours to a day or two.

Effusion stage : The symptoms of this stage are in keeping with the amount and rapidity of the effusion : *præcordial oppression*, tendency to *syncope ; dyspnœa*, sometimes amounting to orthopnœa ; *dysphagia, hiccough*, nausea and *vomiting ;* feeble, irregular *pulse ;* sometimes either melancholia, delirium, or acute maniacal excitement.

Absorption is generally rapid, the heart remaining "irritable" for a long time after. If instead of absorption the fluid accumulates and life is not destroyed, the pericardial sac becomes dilated, chronic pericarditis resulting.

Inspection. *Early stage*, excited cardiac action is evidenced by the impulse.

Effusion stage, feeble, undulatory, or absent impulse ; its position displaced upward, or, rarely, downward ; bulging of the præcordium and protruding abdomen if effusion be large.

Palpation. *Early stage*, excited or tumultuous impulse ; pericardial *friction fremitus* rare.

Effusion stage, feeble or absent impulse, and if present, its position is changed.

Percussion. *Early stage*, normal.

Effusion stage, cardiac *dullness*, enlarged vertically and laterally, and, if considerable fluid, of a *triangular shape*, with the base of the triangle on a line with the sixth or seventh rib, extending from the right of the sternum to the left of the left nipple, narrowing as it proceeds upward to the second rib, or above, which represents the apex of the triangle. The shape of the dullness is sometimes altered by changing the position of the patient.

Auscultation. *Early stage*, excited cardiac action, and usually a *friction sound* (exocardial murmur) synchronous with cardiac sounds and uninfluenced by respiration, but often increased by pressure with the stethoscope.

Effusion stage, cardiac sounds feeble and deep-seated at the cardiac apex, becoming louder and distinct toward the cardiac base. The friction sound is sometimes heard at the cardiac base.

If *absorption* occur, the above signs gradually give place to the normal, the friction sound returning, of a churning, or clicking, or grating character, gradually disappearing.

Diagnosis. *Endocarditis* is often confounded with pericarditis, the points of distinction between which will be pointed out when discussing that affection.

Cardiac hypertrophy or *dilatation* is sometimes confounded with pericardial effusion; the differences between which will be pointed out when discussing those affections.

Hydropericardium may be mistaken for pericardial effusion; see that affection.

Prognosis. Controlled by the severity of the inflammation, causes, and coexisting affections. There is no doubt but that pericarditis with slight effusion is frequently overlooked. If slight effusion, favorable. Death has quickly occurred when a large quantity of fluid has been rapidly effused, the patient being really drowned in his own fluid. *Adherent pericardium* is a frequent sequela.

Treatment. *Perfect rest* in bed with absolute mental quiet. Death has followed neglect of this precaution, and particularly during the stage of effusion.

The important indications for treatment are to limit the inflammatory action and quiet the heart in the first stage, and to promote absorption and prevent cardiac failure in the second stage.

Local applications in the early stage are most valuable; for vigorous patients, the application of *leeches* or *wet cups* to the præcordium, followed by the application of *ice* poultices or iced compresses; in the feeble, *dry cups* in the præcordium, followed by poultices.

For the gastro-intestinal symptoms calomel is indicated, and it may have a beneficial effect on the inflammatory action:

℞. Hydrargyri chloridi mitis, . . gr. ⅓ .022 Gm.
Sodii bicarbonat., ... gr. ij .13 Gm.
Sacchar. lactis, ... gr. ij .13 Gm.
Dry on tongue every two hours until free action.

The late Dr. Pepper said the "following combination is often very acceptable":

℞. Pulv. digitalis,
Mass. hydrargyri, ... āā gr. x āā .6 Gm.
Pulv. opii, ... gr. v .3 Gm.
Quininæ sulph., ... gr. xxx 2. Gm.
Ft. mass et div. in pil. No. xx.
Sig.—One pill three or four times daily.

In young, vigorous patients, early in the disease control the excited cardiac action by small doses of *aconitum* or *veratrum viride;* in the

adult, aged, or feeble using *digitalis;* in all cases *quininæ sulphas* or *hydrochloras* is indicated. Avoid all cardiac sedatives in secondary cases save those following rheumatism.

If pain is severe during the pre-effusion stage, *pulvis opii et ipecacuanhæ* or *morphinæ sulphas* may be cautiously used.

Effusion stage: As the effusion progresses, the free administration of *alkalies*—to wit: *ammonii carbonas*, gr. v (0.3 Gm.) every two hours, with *liquor ammonii acetatis*, or *potassii acetatis*, or *potassii carbonatis*, with *quininæ sulphas* or *hydrochloras*, nutritious liquid diet and *stimulants*, being cautious with the use of cardiac sedatives or tonics.

If the pericarditis is secondary, the general treatment of such condition must be continued.

If the effusion has a tendency to linger, *blisters* to the præcordium and *potassii iodidum* should be used, and if the symptoms of oppression are marked or the effusion linger, *paracentesis* is indicated. Dr. Roberts, in his monograph, gives an account of sixty cases of paracentesis with twenty-four recoveries. He advises that the tapping be done in the fossa between the ensiform and costal cartilages on the left side, or in the fifth left interspace near the junction of the sixth rib with its cartilage.

Dr. Tyson recommends the use of a blister as soon as the diagnosis is determined. He says: "There is no other disease in which I am so satisfied of the efficiency of a blister; it helps to prevent effusion and also to promote the absorption of effusion."

The diet must be nutritious and easy of digestion throughout the disease. If evidence of cardiac failure, use *strychninæ sulphas*, gr. $\frac{1}{24}$ (0.0025 Gm.), hypodermically, three or four times daily.

CHRONIC PERICARDITIS.

Synonym. Adhesive pericarditis.

Definition. A chronic inflammation of the pericardium, with either distention of the sac by fluid or adhesions of the pericardium (adherent pericardium); characterized by impaired cardiac action and disturbances of the circulation.

Causes. Almost always the result of an acute attack. The line of demarcation between the acute and chronic forms is not sharp.

Pathological Anatomy. If the effusion be absorbed, the pericardial surfaces are *agglutinated* by several layers of lymph, which

increase the thickness of the membranes half an inch or more, and the outer surface of the pericardium becomes adherent to the chest walls.

If the fluid is not absorbed, it may progressively accumulate, distending the sac in all directions, displacing the diaphragm and interfering with the functions of the surrounding viscera, or a low grade of inflammation supervenes, the fluid becoming purulent (empyema of the pericardium), the disease terminating fatally after a variable period.

As much as eight to ten pints of fluid have accumulated in the sac.

Symptoms. *Præcordial pain* and *distress;* irregular, *feeble cardiac action; dyspnœa*, aggravated by movement, and *disturbed circulation.*

An agglutinated pericardium seriously increases the danger from an attack of any pulmonary inflammation.

Inspection. If the effusion be present, bulging of the præcordium and displacement of the impulse.

If adhesions are formed between the pericardial surfaces as well as with the chest walls, inspection reveals *depression of the præcordium*, narrowing of the spaces, increased extent but displaced impulse, uninfluenced by deep inspiration, and *recession* of the intercostal spaces (*systolic dimpling*) and epigastrium with every systole of the heart, the result of the adhesions.

Palpation. If effusion, displaced, feeble, or absent impulse; if adhesions, displaced and tumultuous impulse; occasionally a pericardial fremitus is distinguished.

Percussion. If effusion, the dullness has more or less the character described for acute pericarditis.

If adhesions, the cardiac dullness is but slightly modified.

Auscultation. If effusion, cardiac sounds feeble and deep-seated at the apex, louder and more distinct at the cardiac base.

If adhesions, cardiac sounds are heard with equal distinctness in their several positions, associated with a rough friction sound (exocardial murmur).

Treatment. If effusion, *blisters* to the præcordium, with *potassii iodidum* to hasten absorption, the patient being supported by nutritious diet, *quininæ sulphas, ferrum and stimulants*, and perfect quiet. If these means fail to remove the fluid, or if the fluid be purulent, *paracentesis* should be performed at once.

If adhesions of the pericardium have resulted, the application of blisters to the præcordium, with the administration of *potassii iodidum*, alternating with *ferrum* and *quininæ hydrochloras*, are indicated, with nutritious diet, stimulants, and perfect quiet.

HYDRO-PERICARDIUM.

Synonym. Pericardial dropsy.

Definition. The accumulation of water in the pericardial sac, *minus* inflammation; characterized by præcordial distress, disturbed cardiac action, dyspnœa, and dysphagia.

Causes. Usually a part of a general dropsy; Bright's disease; sudden pneumothorax; pressure of an aneurism or other mediastinal tumor; disease or thrombosis of the cardiac veins.

Pathological Anatomy. The fluid may range in quantity from an ounce to one or two pints, and is of a clear, yellowish or straw-colored serum, at times turbid or bloody, and of an alkaline reaction.

If the amount of fluid be large, the sac is dilated, its walls thinned by the pressure, and has a sodden appearance.

Symptoms. Dropsy of the pericardium is so generally associated with hydrothorax or dropsy of the pleuræ that the symptoms are but an aggregation of those attending upon that condition—to wit: *disturbed cardiac action, dyspnœa, dysphagia, dry cough, and feeble circulation.*

The physical signs are exactly those of the stage of effusion of pericarditis, *minus* a friction sound.

Diagnosis. *Pericarditis with effusion* and hydro-pericardium present nearly the same signs and symptoms, a differentiation being possible only by a history of the case and the symptoms of the attack.

Prognosis. Controlled entirely by the cause.

Treatment. Depends upon the cause of the attack. If the amount of fluid in the pericardial sac be great, *paracentesis* will give relief.

ACUTE ENDOCARDITIS.

Synonyms. Valvulitis; exudative endocarditis.

Definition. An acute fibrinous inflammation of the serous membrane lining the cavity of the heart and particularly its valves, in

severe cases the chordæ tendineæ being involved, resulting in changes in the valves or orifices of the heart, or both; characterized by cough, dyspnœa, disturbed cardiac action, nausea, vomiting, and more or less marked febrile reaction.

Acute endocarditis occurs in two distinct forms: *plastic* or simple *exudative* endocarditis; *ulcerous* or *diphtheritic* endocarditis.

Causes. Usually secondary to acute articular rheumatism (particularly in young people), pleuritis, pneumonia, pericarditis, Bright's disease, scarlatina, influenza, and diphtheria. Rarely attacks of endocarditis are due to a gonorrhœa. The association of acute endocarditis and chorea is frequent.

While as yet no specific micro-organism has been discovered, the view is gaining, however, that it is a microbic affection.

Pathological Anatomy. Inflammation of the endocardium is usually limited to the left side of the heart after birth, during fœtal life the reverse being the case. The inflammation is limited or especially marked at the valvular portions of the endocardium, owing probably to the presence of fibrous tissue beneath the membrane in these situations, and to the strain which falls upon the valves during the performance of their functions.

Hyperæmia from congestion of the vessels beneath the membrane, with considerable swelling of the valvelets, the result of an *exudation of lymph and serum* beneath and on the free surface of the membrane covering the valves and *chordæ tendineæ*, resulting in the roughening of the surfaces and the agglutination of the mitral valves to each other, and of the aortic segments to the walls of the aorta, or the proliferation of the endocardial connective tissue, forming the nuclei of the so-called warty excrescences or vegetations, their size being increased by the deposition of fibrin from the blood on its passage through the orifices.

These vegetations may be detached by friction, giving rise to *emboli*, which may be washed by the blood current to the left side of the brain, or into the kidneys and the spleen.

In the ulcerative variety a process of softening takes place in the fibrinous deposits, leading to ulcerations and perforations.

Symptoms. The affection is usually masked by the course of another disease until disturbances of the circulation direct attention to the heart.

The *onset* is often by *increase of temperature, præcordial distress,*

short cough, slight *dyspnœa*, more or less persistent *vomiting; increased cardiac action*, often rapid and tumultuous, with *throbbing carotids* and noises in the ear. As the inflammation progresses, the cardiac action and pulse decline in frequency, with more or less congestion of the lungs and venous stasis.

Auscultation. Shows a change in the character of the sounds or the development of murmurs at the various orifices, the character and points of distinction between which will be pointed out when discussing valvular diseases of the heart.

Duration. Between one and three weeks.

Diagnosis. Unless it is a rule of practice to always auscult the heart, many cases will pass unobserved or undetected.

Pericarditis is distinguished from endocarditis by the character of the physical signs. In pericarditis the murmur or friction sound is heard with either cardiac sound, is near to the ear, and influenced by pressure of the stethoscope, besides being associated with more or less alteration in the size and shape of the cardiac dullness, and is not transmitted, while in endocarditis the murmur takes the place of or is associated with the cardiac sounds, and is transmitted to points beyond the præcordia, with the absence of change in size and form or increased dullness on percussion.

If embolism occur, a new set of symptoms develop; embolism of the kidneys causes sudden, deep-seated lumbar pain, with albuminuria and even hæmaturia; embolism of the brain, sudden palsies and sudden disturbance of consciousness; of the spleen, sharp pain and tenderness in the splenic region; of the skin, petechial or purpuric spots.

Prognosis. Acute endocarditis is not very dangerous to life, hence a favorable prognosis may be given; regarding the ultimate results of valvular lesions, however, the prognosis is grave.

Treatment. *Absolute rest in bed.* At the onset leeches or *wet cups* to the præcordium, followed by ice, or, what may be preferable to the patient, *poultices*.

The excited circulation should be controlled by *aconitum*, *veratrum viride*, or *digitalis*, each of these drugs having their particular indication.

The free administration of such *alkalies* as *ammonii carbonas*, *potassii acetas* or *carbonas*, until the urine is decidedly alkaline, may prevent permanent changes in the valves or orifices.

If alkalies fail and the inflammation shows a tendency to linger, good results are often obtained by a slight *hydrargyrum* impression.

If signs of oppressed circulation appear, the hands becoming blue, the face and extremities œdematous, with congestion of the lungs, the free use of *ammonii carbonas*, *spiritus ammonii aromaticus*, *nitroglycerinum*, *digitalis*, *strophanthus*, hypodermic injections of *strychninæ sulphas*, and *stimulants* are indicated. No drug equals *atropinæ sulphas* in œdema of the lungs, no matter what the cause. The free use of *ammonii carbonas* will often prevent or break up heart clots. After the acute symptoms have subsided, more or less absorption of the exuded lymph has followed the free use of *potassii iodidum*. During the entire course of the affection the diet should be of the most nutritious but digestible character.

MALIGNANT ENDOCARDITIS.

Synonyms. Ulcerative endocarditis; septic, mycotic, and diphtheritic endocarditis.

Definition. An acute *septic* inflammation of the lining membrane of the heart, with a strong tendency to ulceration; characterized by depression of the vital forces with more or less cardiac distress.

Causes. The specific micro-organism has not yet been determined. Frequently complicates pneumonia. Associated with erysipelas and septicæmia. Rarely associated with acute rheumatism. Cases have been reported associated with or following influenza. Gonorrhœa is a rare cause.

Pathological Anatomy. The changes are those of acute endocarditis up to the development of the thickening of the endocardium lining the valves, and the development of the vegetations. Instead of the poison spending its force and the chronic condition obtaining, a process of softening, ulceration, development of abscesses and perforation of leaflets follows, resulting in loss of structure, general septic infection, and the development of emboli, which lead to infarctions, with their results in either brain, kidney, spleen, eye, or skin.

Symptoms. Vary greatly, but always associated with constitutional signs of *sepsis*—a typhoid state, such as headache, restlessness, varying delirium with coated, dry tongue, sordes on teeth and lips,

nausea, *vomiting*, loose or disordered stools, enlarged spleen, albumin in urine, and an *irregular temperature record*, varying from 100° to 104° F. or higher, associated with *rigors* and profuse *sweating*.

The *cardiac action* is rapid, irregular, and weak—a compressible pulse.

In the notes of twelve cases observed in the Philadelphia Hospital are the following symptoms: attacks of *prolonged dyspnœa* with paroxysms of intensity, or a slightly quickened respiration with *paroxysms* of *dyspnœa* occurring every few days in patients with hectic temperature record. In four cases the paroxysms occurred three times daily, with respirations under twenty-five between the paroxysms, for three weeks preceding death. Usually the respirations are so oppressed that the recumbent position is impossible for long periods. Another frequent symptom is marked *cyanosis*, either transient or lasting for days before the end.

A frequent symptom of ulcerative endocarditis is a peculiar *facies*, indicative of a sense of impending danger, great anxiety, or terror.

If embolism occur, there are superadded symptoms varying with the organ affected. If the brain, rapidly developing palsies with disorder of consciousness; if the kidneys, deep-seated lumbar pains with hæmaturia or disordered urinary flow; if the spleen, pain and tenderness of the splenic region with increase of temperature record.

Auscultation. The booming, muscular, first sound is superseded by a feeble, irregular cardiac pulsation. Generally, a murmur may be detected.

Diagnosis. One of the most difficult in medicine. Remembering the diseases with which malignant endocarditis may occur, and particularly pneumonia or sepsis, and the dyspnœa, the cyanosis, the facies, and the temperature record, it may be possible to detect the disease much more frequently than formerly.

Prognosis. Unfavorable. Recovery the rarest termination.

Treatment. Entirely symptomatic. Nutritious diet, *quininæ sulphas*, *ferrum*, *alcohol*, *strychninæ sulphas*, *strophanthus*, *caffeina citratra*, and *digitalis*. For the cyanosis, large, frequently repeated doses of *nitro-glycerinum*. Local application seems only to distress the patient, unless it be an *emplastrum belladonnæ*.

CHRONIC ENDOCARDITIS.

Synonyms. Sclerotic endocarditis; interstitial endocarditis; chronic valvular disease.

Definition. Alterations in the cardiac valves or orifices, rendering the former incapable of properly closing the orifices, or causing the narrowed orifice to interrupt the blood current in its normal movement.

The lesions are of two kinds: *obstructive* and *regurgitant.*

An *obstructive lesion*, termed also *stenosis*, is a narrowing of the orifice, thereby obstructing the onward passage of the blood.

A *regurgitant lesion*, termed also *insufficiency*, is such alteration in the valves as permits a portion of the blood to flow backward instead of onward, the true direction of the blood current.

Varieties. I. Mitral regurgitation. II. Aortic regurgitation. III. Tricuspid regurgitation. IV. Pulmonary regurgitation. V. Mitral obstruction. VI. Aortic obstruction. VII. Tricuspid obstruction. VIII. Pulmonic obstruction.

Causes. The great majority of cases are the result of an attack of acute endocarditis following rheumatism, chorea, or the infectious diseases. A chronic endocarditis from the onset may be caused by alcoholism, syphilis, gout, or excessive muscular labor. Chronic Bright's diseases are also exciting causes.

Professor Da Costa has clearly established the development of aortic disease in early life by overwork and strain of the heart.

In the elderly, chronic endocarditis is the result of atheromatous or fibroid changes.

MITRAL REGURGITATION.

This form of valvular disease is also termed mitral insufficiency, and is the most frequent variety of valvular heart disease.

Pathological Anatomy. The most common conditions observed are more or less contraction and narrowing of the tongues of the valves, with irregular thickening and rigidity; atheroma or calcification of the segments; laceration of one or more segments; adhesion of one or more segments to the inner surface of the ventricle; thickened and stiffened or rupture of the *chordæ tendineæ*, and also contraction and hardening of the musculi papillares.

As a result of the regurgitation or leakage of the blood back into

the left auricle, there is a dilatation of the auricle, followed by slight cardiac hypertrophy. Ventricular hypertrophy occurs after a time from the increased number of the cardiac contractions.

Symptoms. Insufficiency of the mitral valves soon leads to cardiac hypertrophy, to compensate for the diminished amount of blood sent onward by the ventricular systole. This condition causes quickened and strong pulse with some shortness of breath on severe exertion. When the "compensation ruptures," there occurs *præcordial distress, cough, dyspnœa; feeble*, soft, rapid, *irregular pulse;* finally, from weakened cardiac action, may result pulmonary congestion, with œdematous limbs and general cyanosis, the abdominal cavity filled, liver congested, urine scanty and albuminous, the patient dying "drowned in his own fluid."

Inspection. Cardiac impulse (apex-beat) displaced to the left and downward. In children and youths, bulging of the præcordia and increased cardiac impulse.

Palpation. Displaced cardiac impulse, early stage being forcible and diffused; as compensation fails, impulse feeble or absent.

Percussion. Transverse and vertical cardic dullness increased.

Auscultation. Systolic blowing or churning murmur, audible in the mitral area, propagated to the apex, left axilla, and under the angle of the scapula, either occurring with or taking the place of the *first sound* of the heart, the second sound being markedly accentuated.

Prognosis. So long as the compensating hypertrophy can be maintained, the prognosis is not unfavorable; when dilatation supervenes, however, the patient soon perishes, either from congestion of the lungs or dropsy and exhaustion.

AORTIC REGURGITATION,

Termed also aortic insufficiency, occurs next in frequency to mitral insufficiency.

Pathological Anatomy. The valves or segments adhere to the walls of the aorta, or a segment is lacerated or may be perforated, or, more commonly, the segments are shrunken, deformed, and rigid, permitting the regurgitation of the blood. These deficiencies in the valves are usually associated with more or less dilatation of the orifices.

The inability of the aortic valves to completely close the aortic

orifice at the proper moment allows the blood that should go onward to flow back into the left ventricle, and the normal flow of blood from the left auricle continuing, causes overfilling of the ventricle, which results in a dilatation of its cavity, and the extra effort of the ventricle to empty itself results in hypertrophy of the walls. In no other condition does the dilatation and hypertrophy of the cardiac walls reach such a degree. The older writers named this enormous enlargement of the heart "*cor bovinum.*"

Symptoms. There are no characteristic symptoms so long as the insufficiency is compensated by just enough hypertrophy of the ventricular walls, but as the muscular growth increases, the symptoms are those of marked cardiac hypertrophy—to wit: forcible cardiac action, headache, tinnitus aurium, congestion of the face and eyes, with *pulsating vessels*, even small ones pulsating that before were not visible to the eye; pulsations of the retinal vessels can be recognized with the ophthalmoscope; the *receding pulse*, which is particularly characteristic—forcible impulse but rapidly declining, called "water-hammer" pulse and also the "Corrigan pulse."

As soon as there is the slightest failure in the compensation, the cardiac action becomes excessive and distressing with palpitation, causing anxiety and fear upon the part of the patient.

When "compensation ruptures," dyspnœa, increased on exertion, cough, cyanosis, hepatic enlargement, congestion of the kidneys, with scanty, albuminous urine, ascites, and dropsy develop either gradually or rapidly, calling for prompt medication. If mitral insufficiency is now superadded, general venous stasis and death rapidly occur.

Præcordial pain is usually present in aortic disease. It may be a sensation of constriction in the cardiac region, or sharp, shooting pains extending to the arms—anginoidal attacks.

Inspection. Forcible cardiac impulse.

Palpation. Strong, full cardiac impulse.

Percussion. Cardiac dullness increasing transversely and vertically.

Auscultation. *First sound*, forcible; *second sound*, replaced or associated with a *churning*, *rushing*, *or blowing murmur* of low pitch, distinct at the second right costal cartilage, but most distinct at the junction of the sternum and the fourth left costal cartilage, transmitted downward toward and below the apex.

Prognosis. The one valvular disease most likely to occasion

sudden death; still, so long as the compensating hypertrophy remains intact, compatible with quite an active life.

TRICUSPID REGURGITATION.

Pathological Anatomy. This form of valvular insufficiency is either associated with right-sided cardiac dilatation from pulmonary obstruction, or is the result of mitral disease.

The tricuspid orifice is dilated in the majority of cases; occasionally the segments of the valves are contracted or adherent to the ventricle.

Symptoms. Venous stasis with its various consequences, and especially *pulsation of the jugulars*, synchronous with the cardiac movement, and, finally, general venous pulsation, especially of the liver, pulmonary congestion, engorgement of the kidneys, and dropsy. These symptoms are superadded to those of the affections with which tricuspid insufficiency is always associated.

Inspection. Diffused, wavy, cardiac impulse; jugular pulsation synchronous with the cardiac movement, uninfluenced by respiration, also more or less prominent hepatic pulsation.

Palpation. The cardiac impulse extended, but feeble.

Percussion. Dullness on percussion, extending to the right and below the sternum.

Auscultation. The first sound is accompanied by a blowing murmur most intense at the junction of the fourth and fifth ribs with the sternum, distinct over the xiphoid appendix, becoming feeble or lost in the left axillary region; often associated, however, with a mitral systolic murmur.

PULMONIC REGURGITATION.

Pathological Anatomy. Insufficiency of the pulmonary valves is of rare occurrence, but when present, the changes correspond more or less with those described for aortic regurgitation.

Symptoms. Those of dilatation of the right side of the heart and consequent pulmonary congestion—to wit: dyspnœa, deficient aëration of the blood and cyanosis, distention of the superficial vessels, palpitation of the heart, præcordial distress, sudden suffocative attacks, and dropsy.

Percussion. The cardiac dullness extending to the right of the sternum.

Auscultation. A loud, blowing murmur associated with the second sound of the heart, most distinct at the junction of the third left costal cartilage and the sternum.

Prognosis. Death results, sooner or later, from dropsy and exhaustion.

MITRAL OBSTRUCTION.

Mitral obstruction or stenosis is not so frequent as regurgitation, and is very often associated with the latter.

Pathological Anatomy. Mitral stenosis is caused by deposits around the orifice, the result of endocarditis, or else the segments of the valves are "glued together by their margins," leaving but a funnel-shaped opening, the so-called "buttonhole" mitral valve. Vegetations on the valves lead to more or less obstruction to the blood-current.

Symptoms. Hypertrophy of the left auricle results from obstruction at the mitral orifice, followed in time by dilatation, the symptoms of stenosis being unobservable until the "compensation ruptures," or until dilatation becomes excessive, when occur *irregular*, small, and *feeble pulse*, *dyspnœa*, *cough*, bronchorrhœa the result of bronchial congestion; dilatation of the right side of the heart, soon leading to general venous stasis, dropsy, and death.

Inspection. Normal until auricular hypertrophy, when an undulatory impulse is observed over the left auricle.

Palpation. When cardiac dilatation occurs, a diffused, feeble, and irregular cardiac impulse is felt near the xiphoid appendix.

Auscultation. First sound normal in character, but often irregular in rhythm. The second sound normal. A blowing, sometimes rasping, sound is heard, immediately *after the second sound* of the heart ceases, and immediately *before the first sound* begins—a *presystolic murmur*, heard most distinctly in the mitral area, lessening in intensity toward the cardiac base. The cardiac sounds are all more or less enfeebled if cardiac dilatation occur.

Prognosis. The prognosis is controlled by the duration of the hypertrophy. Under favorable circumstances, mitral stenosis is compatible with a long and rather active life.

AORTIC OBSTRUCTION.

Pathological Anatomy. Stenosis of the aortic orifice is caused by the projection of the valves inward, and their becoming rigid

and thickened, or atheromatous or calcareous, so that they cannot be pressed back by the blood, but remain constantly in the current of the circulation. Occasionally the valves are covered with fibrinous masses, the opening into the artery being thus more or less completely closed, or the segments may be adherent by their lateral surfaces, leaving a central opening, which may be so contracted as to permit the passage of only the smallest probe.

Aortic stenosis is nearly always a disease of advanced life, and is associated with the arterial changes of age. Aortic disease is not nearly so often of rheumatic origin as mitral diseases.

Symptoms. Hypertrophy of the left ventricle rapidly supervenes upon aortic stenosis, and so long as the cardiac hypertrophy is just sufficient for compensation, there will be no subjective symptoms, many cases of stenosis being discovered when the individual is examined for insurance or other reasons. The *pulse* is *small*, slow, and hard. When, however, the compensatory hypertrophy begins to fail, the supply of blood to the brain is insufficient in many cases, and pallor, with attacks of *vertigo*, *syncope*, or slight epileptiform seizures occur; finally, as dilatation of the left ventricle and incompetence of the mitral valve result, there occur pulmonary congestion, dyspnœa, and general venous stasis, the pulse soft and feeble.

Palpation. Lowered cardiac impulse, strong in the early stage, feeble when dilatation occurs.

Percussion. The cardiac dullness is increased vertically, the transverse dullness being but slightly increased.

Auscultation. The first sound of the heart is replaced or associated with a *harsh*, *rasping sound*, whistling at times, having its greatest intensity at the junction of the second right costal cartilage with the sternum, transmitted along the vessels; the murmur may sometimes be heard a short distance from the patient.

Usually, aortic stenosis is associated with more or less aortic regurgitation, whence a *double murmur occurs*, having its greatest intensity at the base of the heart, the so-called to-and-fro, or see-saw murmur.

Prognosis. So long as compensation is maintained the condition of the patient is comfortable, if a quiet life be followed. When the compensation is ruptured, the usual symptoms of dilatation, venous stasis, and dropsy soon ensue.

TRICUSPID OBSTRUCTION.

This condition is one of the rarest affections of the heart, and if it ever does occur with or following an attack of endocarditis, the anatomical changes are similar to those of mitral obstruction. This condition soon leads to auricular dilatation; venous stasis rapidly supervenes, associated with venous pulsations similar to those described when speaking of tricuspid regurgitation.

PULMONIC OBSTRUCTION.

Pathological Anatomy. Always a congenital malady, the changes consisting in "constriction of the pulmonary artery, unclosed foramen ovale, unclosed ductus Botalli, stricture at the ductus Botalli, with hypertrophy of the right cavity and frequent association with tuberculosis of the lungs."

Hypertrophy of the right ventricle may ensue, the walls becoming almost as thick as those upon the left side.

Those in whom these congenital defects in the cardiac structure occur are otherwise weak, develop slowly, have flabby tissues, soft bones, and seem poorly nourished.

Symptoms. The hypertrophy which often ensues may keep life apparently comfortable for some time, but sooner or later "compensation ruptures," when cough, dyspnœa, cyanosis, and death occur.

Prognosis. The duration of these congenital affections is short, usually from a few days to a few months; although several well-authenticated cases record a much longer duration.

DIAGNOSIS OF VALVULAR DISEASES.

In making a differential diagnosis between the various forms of valvular disease of the heart, strict attention must be paid to the points of greatest intensity at which the several murmurs are heard.

A *murmur* occurring with or taking the place of the *first sound* of the heart—the ventricular systole—heard most distinctly at the apex, transmitted to the left axilla, and to the inferior angle of the scapula, signifies mitral regurgitation—*a mitral systolic murmur.*

A *murmur* occurring with or taking the place of the *first sound* of the heart, with its point of greatest intensity at the xiphoid appendix, signifies regurgitation at the tricuspid orifice—*a tricuspid systolic murmur.*

A *murmur* heard with the *first sound* of the heart, high-pitched, rasping or grating in character, with its point of intensity greatest at the second right costal cartilage, signifies obstruction at the aortic orifice—*an aortic systolic murmur.*

A *murmur* heard with the *first sound* of the heart, soft in character, with its point of intensity most distinct at the junction of the third left costal cartilage with the sternum, signifies obstruction at the pulmonic orifice—*a pulmonic systolic murmur.*

A *murmur* occurring immediately after the *second sound* of the heart, and immediately before the beginning of the first sound of the heart, signifies obstruction at the mitral orifice—*a presystolic mitral murmur.*

A *murmur* heard with or taking the place of the *second sound* of the heart, most distinct at the second costal cartilage, to the right of the sternum, and well transmitted toward the apex or below, signifies insufficiency or regurgitation at the aortic orifice—*an aortic regurgitant or diastolic murmur.*

Although eight distinct valvular murmurs have been described as occurring in the heart, those on the right side are of rare occurrence, and hence of little clinical importance.

If a *murmur* be heard with the *first sound* of the heart, it is almost certainly *aortic obstructive or mitral regurgitant;* and if *heard* with the *second* sound, it is probably *aortic regurgitant.* A *presystolic mitral* murmur is also of comparatively rare occurrence, the force with which the blood passes from the left auricle into the left ventricle being, under ordinary circumstances, insufficient to excite sonorous vibrations.

Functional or anæmic murmurs may be confounded with the various forms of valvular disease of the heart. The chief points of distinction between them are, that an anæmic murmur, which is always heard at the base of the heart, is always systolic in time, not transmitted away from the heart, and is soft in character, low in pitch, and of variable intensity, now being heard, now entirely absent.

Treatment. There is no special plan of treatment for each form of valvular disease. Prof. J. M. Da Costa says: "I hold that the precise valve affected is not, with our present resources, the keynote to the treatment of valvular heart disease. We are to take as indications: 1. The state of the heart-muscle and of the cavities. 2. The rhythm of the heart-action. 3. The condition of the arteries and veins and

of the capillary system. 4. The probable length of existence of the malady and its likely cause. 5. The general health. 6. The secondary results of the cardiac affection."

A good rule in practice is that if the apex-beat is not displaced, the cardiac dullness is not increased to the right of the sternum, and dyspnœa is absent, medication is not indicated and even may be injurious.

The important point to bear in mind in the treatment of valvular disease of the heart is that it is associated either with *cardiac hypertrophy or dilatation*, and the treatment, if any at all be required, is directed toward this secondary condition. If compensation be complete, attention to the condition of the bowels, kidneys, and digestion, with some general directions as to exercise, are all that is required.

If the hypertrophy become excessive, it is best controlled by either *aconitum*, *veratrum viride*, or *spiritus glonoini*.

If dilatation have occurred, the heart's action weak and feeble, the circulation impeded, and venous stasis has followed, *digitalis*, *caffeinæ citrata*, *strophanthus*, or *sparteinæ sulphas*, with more or less active purgation, is indicated.

If fatty degeneration of the heart result, the indications are for cardiac *rest*, *strychninæ sulphas*, *stimulants*, *strophanthus*, or *spiritus glonoini*, and attention to the excretions.

If the cardiac rhythm is disturbed, add *belladonna* or *lithii bromidum* to whatever other plan of treatment is being used.

If the capillary circulation is weak, *strophanthus* and *nitro-glycerinum* (glonoinum) act better than digitalis, which latter has the power of contracting the arterioles.

Any of the secondary results of the valvular affection are to be treated according to the particular indications.

CARDIAC HYPERTROPHY.

Definition. An overgrowth or increase in the muscular tissue which forms the walls of the heart; characterized by forcible impulse, over-fullness of the arteries, diminished blood in the veins, and accelerated circulation.

Causes. Obstruction to the outflow of blood, resulting from valvular disease of the heart; emphysema; Bright's disease; arterio-fibrosis; functional over-action; excessive use of tobacco, tea, coffee, or excessive muscular action.

Varieties. I. *Simple hypertrophy*, or a simple increase in the thickness of the cardiac walls; II. *Eccentric hypertrophy*, increase in the cardiac walls and dilatation of the cavities, causing a *dilated hypertrophy;* III. *Concentric hypertrophy*, increase in the cardiac walls with decrease of the cavities, a very rare form.

Pathological Anatomy. Hypertrophy of the heart is usually limited to the left side, the ventricles more commonly than the auricles, the latter dilating.

The shape of the heart is altered by hypertrophy; if the right ventricle, the heart is widened transversely and the apex blunted; if the left ventricle, the heart is elongated and, as a rule, the cavity is dilated; if both ventricles are hypertrophied, the heart has a globular shape. From increase in weight the heart may sink lower during the recumbent position, thereby lessening the area of cardiac dullness, but during the sitting or upright posture it sinks lower in the chest and to the left, causing more or less prominence of the abdomen.

The increase in the size of the organ is a true increase or hypertrophy of the muscular tissue, and not a hyperplasia. The tissue is firmer and the color brighter and fresher than when the size of the organ is normal.

The *cor bovinum* of the old writers is an enormous hypertrophy of the heart with dilatation of its cavities.

Symptoms. Depend upon the amount of hypertrophy. The most common are *increased and forcible cardiac action*, the arteries becoming fuller, the veins less full, and the circulation accelerated; *pulsating carotids* and *aorta*, *headache*, often vertigo, frequent *epistaxis*, *congestion of the face and eyes*, *tinnitus aurium*, *dyspnœa* on exertion, *dry cough*, restless nights, with more or less jerking of the limbs; occasional præcordial pains shooting toward the left axilla; full, firm, *bounding pulse*, and pulsations in the superficial arteries.

A sphygmographic tracing shows the line of ascent vertical and abrupt, but the apex is rounded, and the line of descent is oblique, unless there is more or less insufficiency of the valves.

Inspection. Often fullness or prominence of the præcordium, with distinct impulse.

Palpation. The impulse is felt one or two intercostal spaces lower down and to the left, and is stronger and more or less diffused—the heaving impulse.

Percussion. The area of cardiac dullness is increased vertically

and transversely upon the left side of the sternum, unless the right ventricle is also hypertrophied, when the cardiac dullness is increased to the right of the sternum.

Auscultation. If simple hypertrophy without any coexisting changes in the valves or orifices, the first sound has a loud and somewhat metallic quality, the second sound being strongly accentuated.

Sequelæ. Cerebral hemorrhage; miliary cerebral aneurisms; dilatation of the heart; fatty changes in the cardiac tissue.

Diagnosis. Hypertrophy of the heart can scarcely be mistaken for any other disease if a careful study of the physical signs be made.

Prognosis. When the result of valvular disease, the hypertrophy is said to be compensatory. If the result of Bright's disease, emphysema of the lung, or if occurring late in life, or associated with atheromatous degeneration of the vessels, the prognosis is unfavorable. When the result of functional over-action in the strong and robust, a further enlargement can often be prevented by active and persistent treatment.

Treatment. The indications are, if the hypertrophy be excessive, to *lessen the force* and *number* of the cardiac pulsations and to *remove the cause* whenever possible.

The former indications are best met by the persistent use of *tinctura aconiti* in small doses, ♏j–ij (0.06–0.12 Cc.), three times a day, or *tinctura veratri viridis*, ♏j–ij (0.06–0.12 Cc.), three times a day, and at the same time keeping the bowels, kidneys, and the skin acting freely. A certain amount of hypertrophy is beneficial in chronic valvular disease, and drugs should not be administered simply because a cardiac murmur is discovered on auscultation.

The habits of the patient are to be corrected, all laborious or active exercise to be restricted, the patient to be in the recumbent posture several hours during the day if possible, the diet being restricted, avoiding all forms of stimulants, such as liquors, tobacco, tea, and coffee.

Cases of cardiac hypertrophy associated with Bright's disease are often relieved by *digitalis*, the cardiac distress being secondary to the kidney disease, for which the digitalis is used.

There is no doubt that in rare instances cardiac pain follows the use of digitalis, which is probably due to the firm and powerful cardiac contractions produced by digitalis; such cases do better with *caffeinæ citrata* or *strophanthus*.

Cases of cardiac hypertrophy associated with anæmia should, in addition to *digitalis* and rest, be placed upon a course of *ferrum*.

DILATATION OF THE HEART.

Definition. An increase in the size of one or more of the cavities of the heart, characterized by feebleness of the circulation, terminating in venous stasis, cyanosis, œdema, and exhaustion.

Causes. Over-exertion in those of feeble resisting powers, as youths or soldiers, as first pointed out by Prof. Da Costa; chronic valvular disease; emphysema; chronic bronchitis; gout; Bright's disease; alcoholism; syphilis.

Varieties. I. *Simple dilatation*, the cavities being enlarged, the walls normal. II. *Active dilatation*, corresponding to eccentric hypertrophy; the cavities being enlarged and the walls increased in thickness, the so-called "dilated hypertrophy." III. *Passive dilatation*, the cavities being enlarged and the walls thinned or stretched.

Pathological Anatomy. The right side of the heart is far more frequently involved than the left side. The shape of the organ is altered, depending on the part affected. The weight of the organ is, as a rule, increased, as hypertrophy almost always accompanies or precedes dilatation.

The muscular tissue is generally pale, mottled, and softened, and under the microscope presents evidences of degeneration. The orifices also participate, and especially the auriculo-ventricular orifice, resulting in the valves becoming incompetent to close the orifices, and this latter effect is added to by the removal of the basis of the papillary muscles a greater distance from the orifice, in consequence of the extension of the wall.

When the auricles dilate, the large venous trunks opening into them unprotected by valves commonly participate in the dilatation, and may become greatly enlarged.

The passive congestion of the organs that follows the feeble circulation produces changes in their structure.

Symptoms. Those associated with enfeebled circulation—to wit: *Feeble pulse*, veins distended, arteries emptied; *headache*, aggravated by the upright position; attacks of *syncope*, *cough*, with any of the following phenomena of venous congestion; of the lungs, *dyspnœa;* liver, *jaundice;* stomach, *dyspepsia;* intestines, *constipation;* kidneys, *scanty*, often albuminous, *urine;* brain, *dullness* of the mind

and *vertigo*, often relieved by a copious epistaxis; and, finally, *dropsy*, beginning in the lowerextremities, the patient dying from exhaustion.

Great relief often temporarily follows any of the above symptoms under treatment; sooner or later, however, the venous stasis produces the final symptoms noted.

Inspection. Veins of the surface distended and enlarged; indistinct cardiac impulse, often diffused and wavy; if associated with tricuspid insufficiency, there is pulsation of the jugular.

Palpation. Feeble and irregular fluttering, but heaving impulse.

Percussion. Cardiac dullness extended transversely, and especially increased on the right side.

Auscultation. If no valvular lesion accompany the dilatation, the cardiac sounds are weaker than normal, the first sounds having a sharper quality than normal; if accompanied by valvular lesions, cardiac murmurs are present.

Diagnosis. *Hypertrophy* of the heart shows increased cardiac dullness, and is a disease of powerful cardiac action, while dilatation is an affection of feeble action associated with dropsy.

Pericardial effusion has many points of resemblance to cardiac dilatation, but it begins suddenly, associated with some acute malady, and while the heart sounds are indistinct or feeble at the apex, they both have their normal qualities at the cardiac base, while dilatation of the heart has a chronic history, results in general venous stasis, the cardiac sounds being of the same intensity over the entire præcordium.

Prognosis. Unfavorable, death resulting from gradual exhaustion, or suddenly by cardiac paralysis if there be some undue excitement. With careful living life may be prolonged for years.

Treatment. Dilatation of the heart is incurable. In all cases there are two important indications: The first to maintain the general nutrition of the patient, and the second to control or prevent all irregular or violent cardiac action. The first is accomplished by a generous diet, moderate exercise, with *bitters* to increase the appetite and *ferrum* to improve the blood, and, in a majority of cases, the more or less free use of a good *red wine*.

The second indication is met by the observance of strict rules in regard to exercise and such heart tonics as *digitalis* in powder, tincture, or infusion, or a combination like the following:

℞. Tincturæ nucis vomicæ, ... f℥ss 15. Cc.
Tincturæ digitalis, ... f℥ss 15. Cc. M.
Sig.—Fifteen to twenty drops after meals, in water.

Drs. Hare and Coplin have demonstrated by careful research that the prolonged use of digitalis actually increased the development of the normal heart muscle.

Strychninæ sulphas, gr. $\frac{1}{24}$ (0.0025 Gm.), three times daily, is a valuable cardiac tonic; the same may be said of *caffeinæ citrata*, gr. j–iij (0.06–0.2 Gm.), three or four times daily. *Sparteinæ sulphas* is a powerful cardiac tonic, particularly of service in the dilating heart of Bright's disease. The *tinctura strophanthus*, alone or in combination with *digitalis*, is valuable. Extractum convallariæ fluidum is not always reliable. *Morphinæ sulphas* in small doses, particularly when compensation is failing and the dropsy becomes great and is associated with marked cyanosis, hypodermically, as suggested by Prof. Bartholow, "often acts like magic in restoring the circulation."

The following pill is often of great advantage:

℞. Ferri reduct., ... gr. j–ij .065–.13 Gm.
Quininæ sulph., ... gr. j–ij .065–.13 Gm.
Pulv. digitalis, ... gr. j .065 Gm.
Morphinæ sulph., ... gr. $\frac{1}{24}$ .0025 Gm. M.
SIG.—Three times a day.

An excellent combination is the following:

℞. Tinct. digitalis, ... f℥iss 6. Cc.
Tinct. cacti grandiflor., ... f℥j 30. Cc.
Caffeinæ citrata, ... ℥j 4. Gm.
Tinct. card. comp., ... ad f℥iv ad 120. Cc. M.
SIG.—Teaspoonful, diluted, three or four times daily.

The bowels, skin, and kidneys should be kept in action, using, if needed, purgatives, diaphoretics, and diuretics. The following combination, suggested by Dr. J. M. Anders, is satisfactory in many instances:

℞. Caffeinæ citrata, ... ℥j 4. Gm.
Strychninæ sulph., ... gr. $\frac{1}{3}$ .022 Gm.
Sparteinæ sulph., ... gr. ij .13 Gm. M.
Ft. capsulæ No. xij.
SIG.—One every three or four hours.

Or the following excellent diuretic pill:

℞. Pulv. scillæ, ... gr. xxx 2. Gm.
Pulv. digitalis, ... gr. xxx 2. Gm.
Caffeinæ citrata, ... gr. xxx 2. Gm.
Hydrarg. chlor. mitis, ... gr. v .3 Gm. M.
Ft. pilulæ No. xxx.
SIG.—One three or four times daily.

If pulmonary congestion develop, *dry cups*, *digitalis*, *caffeina*, *atropina*, and stimulants.

For cardiac asthma, *dry cups*, *morphinæ sulphas*, hypodermically, or *spiritus ætheris compositus* (Hoffman's Anodyne).

For hepatic congestion, *blue mass* or *podophyllin*.

For dropsy, *dry cups* over the kidney, *digitalis* with *potassii acetas*, with *scoparius* and *juniperus*, and *pulv. jalapæ comp.*, ʒj–ij (4–8 Gm.), in water, before breakfast.

If the dropsy is uninfluenced by the above means, success will follow the use of *hydrargyri chloridi mitis*, gr. iij (0.2 Gm.), guarded with *pulves opii*, gr. $\frac{1}{12}$ (0.005 Gm.), three or four times a day.

The treatment of cardiac dilatation and cardiac failure by *baths* and systematic *exercise* has excited much interest and discussion recently, with the result of its indorsement in proper cases. Exercise is employed in one of three plans or, rarely, a combination of these plans: (1) passive exercise and massage (Swedish or Ling plan); (2) movements with limited resistance (Schott plan, but really a modification of the Swedish); (3) method of climbing (Oertel). The *baths* to be those of the Nauheim (saline) natural waters. A number of American and English clinicians report good results with artificial Nauheim baths. This system of cardiac treatment is associated with regulated diet and the use of some cardiac tonics, and business rest.

ACUTE MYOCARDITIS.

Synonyms. Carditis; abscess of the heart.

Definition. An inflammation of the muscular tissue of the heart, by extension from an inflamed pericardium or endocardium, or secondary to pyæmia; characterized by pain, feeble circulation, symptoms of blood-poisoning and collapse.

Causes. The result of endocarditis or pericarditis; pyæmia; typhoid fever; emboli of the coronary arteries.

Pathological Anatomy. Discoloration and softening of the cardiac substance and the infiltration of a sero-sanguineous fluid, fibrinous exudation and pus, leading to the formation of abscesses in the muscular structure of the heart.

The disease leads to the formation of either a cardiac aneurism or

to rupture of the walls of the heart. If recovery occur, cicatrices or depressed scars may mark the site of a former abscess.

Symptoms. The clinical evidences of inflammation of the cardiac muscles are very obscure. If, during the course of one of the maladies mentioned, there are developed *præcordial pain*, irregular and feeble *cardiac action*, *cardiac dyspnœa*, *pyrexia* of a low type, with symptoms of *blood-poisoning* and a tendency to *collapse*, or the symptoms of the so-called *typhoid state*, myocarditis may be suspected.

Diagnosis. The existence of myocarditis can scarcely ever be anything but a presumption, the signs being all negative rather than positive. If during the course of rheumatism, pyæmia, puerperal fever, typhoid fever, pericarditis, or endocarditis, symptoms of cardiac failure appear suddenly, associated with signs of blood-poisoning and collapse, inflammation of the cardiac muscle may be suspected.

Prognosis. The course of acute myocarditis is very rapid, death being the usual termination in from three to five days. Chronic myocarditis pursues a very latent course.

Treatment. Largely symptomatic. Perfect rest of mind, generous diet, free stimulation, and the administration of *quininæ sulphas*, *ferrum*, and *spiritus ætheris nitrosi—a nitrite*.

CHRONIC MYOCARDITIS.

Synonyms. Fibroid heart; chronic interstitial myocarditis; fibrous myocarditis; chronic carditis; cardio-sclerosis.

Definition. A slowly developing hyperplasia of the interstitial connective tissue of the heart, leading to induration of its substance; characterized by shortness of breath on slight exertion, attacks of tachycardia, præcordial pain, disordered circulation, and vertigo. It is proper to state that many cases present no symptoms whatever.

Causes. The most frequent cause is sclerosis of the coronary arteries, leading to imperfect blood supply to the cardiac muscles. Among other frequent causes are diseases of the kidneys, alcoholism, excessive use of tobacco, syphilis, secondary to pericarditis, endocarditis, and acute myocarditis.

There is, undoubtedly, often an inherited predisposition to fibroid changes in the vessels, in which cases the causes named would act as exciting causes.

It is a disease of the aged, save in those instances resulting from hereditary predisposition or from excesses. The old saying, "A man is as old as his arteries," is applicable to this disease.

Pathological Anatomy. The heart is enlarged and dilated. The morbid changes may be diffused, or limited to the walls of the left ventricle, the papillary muscles, and the septum. There is always more or less atheromatous deposit or changes in the aorta. All cases show atheroma in one, more, or all of the coronary arteries. Complete closure of one coronary artery, if produced suddenly, is usually fatal.

On section, the cardiac wall cuts with a distinct resistance. The changes in the heart wall are an "overgrowth of the interfibrillar connective tissue, with development of fibrous tissue. These changes may be uniformly distributed through the substance of the heart when some intoxication, as by alcohol, or some general disturbance of the cardiac nutrition, has led to the myocardial disease; or they may be seen in circumscribed areas when embolic or thrombotic occlusion of branches of the coronary arteries has occasioned anæmic infarction and subsequent sclerosis. In either case the microscope reveals masses of wavy fibrous tissue between the muscular bundles, and often slow degeneration or atrophy of the fibres themselves" (Pepper).

The terminal branches of the coronary arteries are narrowed and sclerotic to the point of obliteration, particularly in cases resulting from syphilis.

"Aneurism of the heart is commonly due to localized cardiosclerosis. The inelastic fibrous tissue gradually gives way before the intracardial pressure, and saccular dilatation results" (Pepper).

Atheromatous changes are often found in other than the coronary vessels, particularly the aorta.

Various degenerative changes occur in other organs, the result of disturbed circulatory action.

Symptoms. The great majority of patients having chronic myocarditis present no symptoms until an extra cardiac effort is called for.

An early symptom is *breathlessness* on slight exertion, with either cardiac *palpitation* or a *feeble, irregular pulse*. Vertigo is frequent and distressing, increased by indigestion and costive bowels. *Anginal* attacks (cardiac pain) or a sensation of constriction or pressure over the præcordium are frequent, often following some exertion or an

attack of indigestion. The pulse-rate is often decreased in frequency in cases which present no other symptom.

A frequent symptom is *syncope*, coming without warning or after sudden exertion, the result of sudden failure of the cerebral circulation.

Among other periodical symptoms are cardiac asthma, pseudo-apoplectic attacks, and hepatic, gastric and nephritic disorders.

As the fibroid changes progress, there develop progressive weakness, dyspnœa, insomnia, disordered digestion, and cerebral weakness, often showing itself as mania, delusional attacks, or dementia.

Percussion. Increased præcordial dullness is usually present, due to the dilated hypertrophy.

Auscultation. The first sound of the heart is valvular in character, the booming or muscular quality having disappeared. Murmurs are very frequent, the result of valvular disease. A very characteristic condition is the irregularity in rhythm and in force, one contraction being fairly forcible, another weak or feeble, and so on.

Diagnosis. A proper appreciation of chronic myocarditis is one of the most important questions in clinical medicine. The term "*Heart Failure*" is the opprobrium of the profession, and yet chronic myocarditis is one of the great causes of cardiac failure during the prevalence of some over-exertion or in acute pneumonia, typhoid fever, and other like diseases.

The points of value in arriving at a diagnosis are: a careful study of the first sound of the heart at the apex; the character of murmurs if present, the condition of the arteries, the dyspnœa, the feeble, irregular pulse in patients past fifty years, and the occurrence of anginal attacks after exertion or mental worry.

Prognosis. This is controlled by the habits of the patient. The disease is incurable, but life may be fairly comfortable for many years if care be exercised.

Treatment. No remedy can remove the fibroid change. The indications are to promote the patient's nutrition, hold in check the progress of the fibrosis, and meet or prevent the symptoms as they arise. Constipation is often a troublesome symptom, and calls for such drugs as *aloes* or *cascaræ sagrada*.

For the general condition, *ferrum*, *arsenicum*, and the *hypophosphites*.

For the *breathlessness*, *spiritus glonoini* (nitroglycerin, one per cent.), or *spiritus ætheris nitrosi*, or *spiritus ammoniæ aromaticus*.

For *cardiac palpitation, potassii bromidum, lithii bromidum*, or *spiritus ammoniæ aromaticus.*

For *cardiac weakness, strychninæ sulphas*, gr. $\frac{1}{24}$ (0.0025 Gm.), three or four times a day, and if the pulse is frequent, *tinctura digitalis*, ♏x–xx (0.6–1.2 Cc.), three times daily, or *caffeinæ citrata*, gr. iij (0.2 Gm.), after meals; maintaining the recumbent position and removing all unfavorable associate symptoms, as constipation, scanty urine, and *dyspepsia* with flatulence.

For the *anginal attacks*, hypodermic injections of *morphinæ sulphas*, gr. $\frac{1}{8}$–$\frac{1}{4}$ (0.008–0.016 Gm.), or *chlorodyne*, ♏x–xx (0.6–1.2 Cc.), repeated as needed.

For the *syncopal attacks*, the patient should be placed in bed and stimulants administered, often used by the hypodermic method, with mustard over the præcordium, and ♏j–ij (0.06–0.12 Cc.) *spiritus glonoini* every couple of hours.

An excellent combination for breathlessness, vertigo, and chest pains is:

℞. Lithii bromidi, ... ℥vss 22. Gm.
Spiriti glonoini, ... ♏xvj 1. Cc.
Liq. potassii citratis, . . q. s. ad f℥viij ad 240. Cc. M.
Sig.—Tablespoonful four times daily, diluted.

The patient must lead a quiet life, refrain from mental worry, physical over-exertion, and eschew *tobacco* and malt liquors. The diet must be plain and simple, with but little tea or coffee. In the elderly, a small amount of good whisky once or twice a day is valuable.

FATTY HEART.

Synonyms. Fatty degeneration of the heart; chronic myocarditis.

Definition. A change in the muscular fibres of the heart, in which the transverse striæ are replaced by granules and globules of fat; characterized by feeble cardiac action, venous stasis, and dyspnœa.

Causes. Impaired nutrition in the elderly; prolonged anæmia; chronic gout; alcoholism; phosphorus poisoning; cancer; tuberculosis and scrofula; diseases of the coronary arteries.

Pathological Anatomy. The distinction must be made be-

tween a deposit of fatty tissue upon or around the heart, and the degeneration of its muscular tissue.

The fatty metamorphosis may affect the whole organ, or the entire ventricular walls, or be limited to portions of them. If the degeneration be marked, the color is yellowish, the tissues soft and easily torn, and to the touch have a greasy feeling, oil being yielded on pressure.

The microscopic changes are characteristic. The striæ of the muscle are easily rendered indistinct by fat and oil globules, gradually becoming more and more obscured, and finally disappearing altogether, the fibres being replaced by fat granules.

Symptoms. Those of weak heart, anæmia of organs, and venous stasis—to wit: *feeble*, *irregular*, but slow *cardiac action; compressible pulse*, *præcordial distress*, often aggravated by attacks of angina pectoris; *dyspnœa*, aggravated on exertion, with anæmia of the various organs from the feeble propulsive power; if of brain, *vertigo*, swooning, or pseudo-epileptic attacks, especially marked on suddenly rising from a recumbent position; if of lungs, *dry*, hacking *cough;* if of gastro-intestinal tract, *dyspepsia* and *constipation;* if of kidneys, *scanty urine*, at times albuminous, and finally *dropsy*, beginning in the lower extremities.

A formidable symptom, causing much inconvenience as well as alarm to the patient, is what he will term his constant "sighing," the Cheyne-Stokes breathing—"A pause in the breathing, a complete suspension of the respiratory acts for a period of time (during which breathing might occur several times in the normal manner), then the resumption of respiration very feebly and slowly, and a gradual and progressive increase in the number and depth of respirations until the maximum is reached, and then again a gradual and progressive diminution in the same order, in the number and depth of the respirations, until another pause occurs"—the "oscillating respiration."

Concomitant symptoms are atheromatous changes in the vessels, and the *arcus senilis*.

Palpation. Weak cardiac impulse.

Percussion. Not markedly changed unless preceded by enlargement of the heart.

Auscultation. First sound feeble, toneless, almost inaudible, the second sound being normal, unless changes in the valves are present.

Diagnosis. Feeble cardiac sounds, with slow pulse, attacks of

cardiac asthma or Cheyne-Stokes breathing, with evidences of arcus senilis, make the diagnosis very certain. The question of fibroid heart must always be considered.

Prognosis. Incurable, the affections pursuing a more or less chronic course. Life may be prolonged at times by treatment, but death finally results from exhaustion, or suddenly from cardiac paralysis or rupture of the heart.

Treatment. Incurable, there being no plan of treatment that can restore the degenerated muscular fibre. Generous diet, very moderate exercise, *stimulants*, *oleum morrhuæ*, and the "triple elixir"—*elixir ferri, quininæ, et strychninæ*, or the *hypophosphites*.

All the excreting organs must be kept active, so as to relieve the crippled heart as much as possible.

To sustain the cardiac action, *strychninæ sulphas*, gr. $\frac{1}{32}$–$\frac{1}{48}$ (0.002–0.0015 Gm.), three or four times daily, is most valuable. Other drugs are *caffeinæ citrata*, *sparteinæ sulphas*, or *tinctura nucis vomicæ*. Digitalis is contra-indicated in advanced cases.

For *syncopal attacks*, *nitro-glycerinum* (*spiritus glonoini*), *spiritus ætheris nitrosi*, *spiritus ammoniæ aromaticus*, or hypodermic injections of *ætheris*, *camphora*, or *spiritus frumenti*.

The recumbent position for hours each day is a valuable means of resting a crippled heart.

PALPITATION OF THE HEART.

Synonym. Irritable heart.

Definition. A functional disturbance of the heart; characterized by increasing frequency of its movements and more or less irregularity of the rhythm, with a strong tendency toward hypertrophy.

Causes. Over-exertion, "the heart-strain" of Da Costa; dyspepsia; uterine diseases; excesses in tea, coffee, tobacco, alcohol, or venery; moral and emotional causes, grief, anxiety, and fear.

Symptoms. Usually palpitation of the heart has a sudden onset after some one of the causes mentioned, with *præcordial oppression or pain; rapid, tumultuous beating*, the impulse being visible through the patient's clothing; *dyspnœa*, *anxiety*, and a sense of *choking or fullness in the throat*, the recumbent position being impossible; *vertigo*, faintness, flashes of light, the pulse full and strong or feeble, the *face*

flushed or pale, the patient having a feeling of anxiety with a sense of *impending danger* and a fear of sudden death. These attacks are paroxysmal, lasting from a few moments to several hours, or a day, the patient often voiding a large quantity of limpid urine after the paroxysm has subsided, when there is a strong tendency to sleep.

Diagnosis. Irritability of the heart is differentiated from the various forms of cardiac disease by the absence of all the physical signs mentioned as occurring in those conditions.

Prognosis. If early and properly treated, favorable.

Treatment. The first point in the treatment of irritability of the heart is to remove the cause; the next, to prevent the recurrence of the attacks of palpitation.

The majority of cases do well after a few doses of either *spiritus ætheris compositus* (Hoffman's anodyne) or *spiritus ammonii aromaticus*, or a combination of *digitalis* and *belladonna*. Permanent relief is often afforded by a combination of *potassii bromidum* and *veratrum viride*. *Trional*, gr. x–xv (0.6–1 Gm.), three times daily, is often useful. If the patient be anæmic, excellent results follow the prolonged use of the *elixir ferri, quininæ, et strychninæ*. Locally, *emplastrum belladonnæ* to the præcordium affords relief. The acute attack is often wonderfully benefited by *ice* over the præcordium.

TACHYCARDIA.

Synonyms. Rapid heart; quick heart; paroxysmal rapid heart.

Definition. Paroxysmal rapid cardiac action, minus or with subjective symptoms, the result of excessive cardiac rapidity.

Causes. Tachycardia is one of the "crises" of cerebral or spinal diseases. Menopause. Neuritis of the pneumogastric nerve; chronic myocarditis; neurasthenia; chronic gastritis; excessive use of tobacco (?); a variety of petit mal (?).

Pathological Anatomy. No characteristic lesions. There may be paralysis of the inhibitory fibers of the vagus, an irritation of the accelerators of the sympathetic, or reflex action from some lesion in the cardiac wall or elsewhere.

Symptoms. The paroxysm is *sudden* in its onset, with or without "warnings"—if these latter, they are in the shape of vertigo, ringing in the ears, and a sense of impending danger. The cardiac

action is increased to 150, 175, 200, rarely 250 beats per minute. The pulse is small, weak, easily compressible, and often irregular, with carotid pulsation (which indicates the emptiness and low tension of the artery, as in aortic regurgitation). The respiration is slightly increased; rarely there is dyspnœa. The surface is at first pale, but soon becomes flushed. The expression is anxious and denotes suffering. There is a feeling of præcordial constriction, with more or less smothering. Rarely, there are no subjective symptoms.

The *duration* is from a few minutes to hours, or days. The attack usually ceases during sleep, but if it does not, the rapidity of the pulse continues during the disturbed sleep.

Auscultation. The first sound is clear and ringing, but not strong and booming. The second sound is weak and lacks the valvular quality of the normal. A murmur is often heard at the apex.

Diagnosis. The differentiation between tachycardia and palpitation is to be made, as also the rapid heart of valvular disease and of irritable heart. The chief point is that in tachycardia the attack is *paroxysmal*, and the number of pulsations exceeds the rapid heart of other conditions.

Prognosis. It is often an unfavorable symptom of some central lesion. If it develop in patients suffering from chronic myocarditis or atheroma of vessels, the fatal result may be sudden.

Treatment. For the *paroxysm*, the application of *ice* to the præcordium, conjoined with a hypodermic injection of *morphinæ sulphas*, gr. ⅙ (0.011 Gm.), and *atropinæ sulphas*, gr. $\frac{1}{100}$ (0.00065 Gm.), and rest in bed. A few large doses of *digitalis* should always be tried. *Tinctura belladonnæ*, *potassii bromidum*, *lithii bromidum*, *strontii bromidum*, or *camphoræ monobromas* are often valuable; remembering that which answers in one case or attack may be useless in another. *Trional*, gr. xxx (2 Gm.), seems to rapidly control a paroxysm. An ice bag over the præcordium has cut short an attack.

The arrest of attacks of tachycardia is reported from compression of the vagus in the neck. Nothnagel reports the case of a patient who could cut short an attack by a full and deep inspiration.

Rosenfeld succeeded in cutting short an attack in four cases by having "the patient squeeze his own arms and elbows into his sides, and at the same time forcibly compress his abdomen."

After the paroxysm, nutritious diet, avoidance of alcohol, tobacco, tea, and coffee, and a course of *arsenicum*, *strychnina*, or *potassii iodidum*.

BRADYCARDIA.

Synonym. Brachycardia.

Definition. A paroxysmal or permanent slowness in the cardiac action. It is agreed that bradycardia begins with a pulse reduced to at least forty beats per minute.

Causes. Often associated with organic nervous diseases. It is a symptom of such cardiac diseases as fibroid and fatty heart and atheroma of the coronary arteries.

It frequently occurs during convalescence from infectious diseases, such as diphtheria, pneumonia, typhoid fever, erysipelas, and rheumatism; uræmia, lead-poisoning, anæmia, and chronic alcoholism are often causes. Balfour says: "Many, if not most, of the sufferers from bradycardia are epileptics."

Symptoms. Slow action of the heart is the chief symptom, varying from 40, 30, 20, to 10 or 8 beats per minute. The pulse is weak, small, and slow. As results of the slow cardiac action are vertigo, noises in the ears, syncopal attacks, and rarely convulsions. The onset may be either sudden or follow "warnings."

Auscultation. The first sound is soft and feeble, and often the second sound is not heard.

As a rule, with reduction in the number of contractions is an increase in their force, and this not obtaining in bradycardia determines its central origin.

Diagnosis. A feeble cardiac contraction, with less than forty beats per minute, determines the diagnosis.

Prognosis. Sudden death a very frequent termination. The cause controls the prognosis.

Treatment. So long as the slow cardiac pulsations are sufficient to supply the requirements of the economy, medication is not needed; when, however, the reverse obtains, resort to rest in the recumbent position, heat to the præcordium, and the use of such remedies as *atropinæ sulphas*, *caffeinæ citrata*, *strychninæ sulphas*, *spiritus glonoini*, or *spiritus ammoniæ aromaticus*. Often the emergency is so great as to call for the hypodermic use of the selected drug.

Digitalis is contra-indicated. Between the paroxysms, such remedies as improve the general health and prevent the progress of the central or exciting cause.

ARRHYTHMIA.

Synonyms. Arrhythmia cordis; irregularity of the pulse.

Definition. A lack of cardiac rhythm, or irregularity in the cardiac pulsations. It is a symptom rather than a disease.

Causes. Valvular diseases; myocardial diseases; cardiac dilated hypertrophy; atheroma of coronary arteries and aorta; excessive use of tobacco, tea, or coffee; flatulent dyspepsia. Neurasthenia, hysteria, and melancholia.

Symptoms. An irregularity in cardiac action, either in the rhythm or the regularity of the *force* of the beats, or an intermission in the cardiac contractions.

The sphygmograph gives the exact condition of the cardiac pulsations and should always be used in cardiac diseases.

Other symptoms that may be present are due to the condition producing the arrhythmia.

Diagnosis. An examination of the pulse, auscultation of the heart, and the use of the sphygmograph determine the arrhythmia.

Prognosis. Depends upon the cause. In functional cases favorable, in organic cases unfavorable.

Treatment. Rest of mind and body, regulated diet, and attention to the secretions.

Tinctura nucis vomicæ, *strychninæ sulphas*, and *digitalis* are each useful. In functional cases the *bromides* are valuable.

ANGINA PECTORIS.

Synonyms. Neuralgia of the heart; breast-pang.

Definition. Paroxysms in which there occur sharp cardiac pains, extending usually into the left shoulder and down the left arm, accompanied by a feeling of constriction of the thorax and a strong fear of impending death.

Causes. Often hereditary; associated with chronic cardiac changes, disease of the coronary arteries or calcification of the valves; the excessive use of tobacco (?); syphilis; according to Trousseau, it is a form of masked epilepsy, and may alternate with true epileptic attacks. Often associated with hysteria (?).

Pathological Anatomy. A disease of the arteries, ossification and occasionally obliteration of the cardiac arteries, producing cardiac ischæmia.

"The pathological changes which stand in a causative relation to the attacks are those of the cardiac plexus of the phrenic and of the pneumogastric nerves. Pressure of enlarged lymphatics, inflammation of parts of the cardiac plexus, with changes in the coronary arteries, seem to be most constant."

Symptoms. A paroxysmal affection, the attacks occurring irregularly; in the interval entire absence of symptoms, or the symptoms of the organic disease causing the paroxysms.

"The patient suddenly sits up in his bed; with a cry of horror indicates the sense of pain at the præcordium. The pain is of great intensity, but is of a cold and sickening character; the chest is fixed, the breathing quickened, and the hand placed over the præcordium finds that the heart's action is slight and enfeebled. The face wears a look of horror, pale and slightly leadened; a cold sweat breaks out upon the forehead; worse than the pain is the feeling of fearful sickness and depression. The poor patient gasps, 'I shall die! I shall die!' and sometimes his short but concentrated sufferings in a few moments end in death" (Sansom). The attack ends suddenly with vomiting, or great flow of urine.

The unpleasant sensations of these patients during an attack, and the nervous disorder associated with it, slowly bring about a mental change. They are depressed and gloomy, sometimes suicidal, and often develop epilepsy.

Attacks of angina in nervous women and children, the hysterical or pseudo-anginal attacks, come on gradually with distention of the abdomen, eructations of gases, excessive restlessness, flushed face, irritable pulse, diffused præcordial pain, and general hysterical phenomena.

In a few cases the pain is absent, but all other symptoms are present—the "angina sine dolore" of Gairdner. Balfour claims that pain is not an essential part of the disease. He has probably never experienced an attack of true angina pectoris.

Diagnosis. The points to be remembered are that the attacks are always paroxysmal, with long or short intervals, the patient having a sense of coldness, and frequently a cold sweat, the heart's action not increased, the chest fixed, and the breathing slow.

Prognosis. True angina pectoris is unfavorable, the patient, sooner or later, either succumbing during the paroxysm or from exhaustion, the result of the cardiac changes.

Pseudo-angina is always favorable.

Treatment. During the interval between the attacks an attempt should be made to remove the exciting cause or diminish its predisposing influence.

For the organic form, no one remedy is comparable with a long course of *potassii iodidum*, gr. x–xx (0.6–1.3 Gm.), three times daily, as the frequency and intensity of the attacks are often diminished and a fair number of cases are retarded, proving the axiom, "the iodides are the digitalis of the arteries."

The efficacy of the iodides is greatly enhanced and the course of the disease favorably influenced by adding full doses of *nitro-glycerinum*.

For the nervous form, all violent emotions and active physical exercise are to be avoided, the diet regulated, and the excretions watched. Among the drugs that are useful are *ferrum*, *arsenicum*, *strychnina*, *phosphorus*, and *zincum*. If the cardiac action be weak, use *strophanthus*. Trousseau urges the administration of *belladonna* in continuous small doses, on the ground of the analogy of the affection to epilepsy. Quain states that a continuous current, the positive pole on the sternum and the negative pole on the lower vertebræ, lessens the severity and frequency of the anginal paroxysms.

For the attack, prompt relief follows the use of *amyl nitras*, ♏ iij–v (0.2–0.3 Cc.), inhaled at the instant, or *morphinæ sulphas*, gr. ¼–½ (0.016–0.032 Gm.), to which may be added with advantage *atropinæ sulphas*, gr. $\frac{1}{100}$ (0.00065 Gm.), hypodermically, or *nitro-glycerinum*, gr. $\frac{1}{100}$–$\frac{1}{50}$ (0.00065–0.0013 Gm.), every hour or two. In many cases the use of gr. $\frac{1}{100}$ (0.00065 Gm.) of this powerful drug, three or four times a day for a long time, lessens not only the frequency, but the severity of the paroxysms. *Chlorodyne*, ♏ x–xv (0.6–1 Cc.), repeated, often affords relief. *Chloroformum* has proven prompt, efficient, and harmless administered as suggested by Balfour—viz., "a half drachm (2 Cc.) is poured upon a sponge at the bottom of a wide-mouthed bottle, from which the patient may breathe *ad libitum*." Dr. William Evans recommends *sparteinæ sulphas*, gr. ¼ (0.016 Gm.) three times daily, between attacks, to prolong the interval and lessen the severity of the paroxysms.

Great care must be exercised with the diet that flatulency and constipation do not occur.

ARTERIO-SCLEROSIS.

Synonyms. Atheroma; arterio-capillary fibrosis (Gull and Sutton); endarteritis chronica deformans (Virchow).

Definition. A chronic degenerative and inflammatory disease of the vascular system, resulting in an overgrowth of the connective tissues of the arteries, followed by calcareous deposits. The changes may extend to the capillaries and veins. As a result of the impairment of the arterial circulation, occur fibroid degenerations in other organs, resulting in loss of elasticity in the walls of the vessels, increase of arterial tension, narrowing of the calibre of smaller arteries, and impairment of the nutrition of the organs supplied.

Causes. Old age, as "longevity is a vascular question, and has been well expressed in the axiom that "a man is only as old as his arteries" (Osler). Heredity is a factor, as arterial degenerations occur in some families at a very early age—thirty to forty years. Alcoholism, syphilis, and other excesses predispose to arterial changes. Lead-poisoning, diabetes, malaria, gout, and rheumatism. Chronic nephritis. More common in men than in women.

Pathological Anatomy. The atheromatous changes are most frequent in the aorta. Rokitansky gives the relative order in which atheromatous degenerations occur as follows, aorta, splenic, femoral, iliac, coronary arteries of the heart, arteries of the brain, uterine, subclavian, brachial, ulnar, and radial.

The internal surface of the affected vessels is irregularly thickened with either gelatinous and translucent, or dense and fibrous, or calcareous deposits or products. If the calcification is extensive, the vessel is changed into a hard, stiff tube. Often the surface of the thickening or deposit is destroyed, presenting the so-called "atheromatous ulcers," which may be covered with masses of thrombus.

The above conditions are the result of inflammatory change in the intima of the affected vessel. This appears three or four times as thick as normal, due to the swelling of its elements, the new growth of connective tissue and the deposit of round cells. Fatty degeneration of the inflammatory products results.

The result of the changes in the arteries is a loss of their elasticity, thus hindering the propulsion of the blood current and raising the arterial tension, leading to hypertrophy of the left ventricle. The

changes finally involving the coronary arteries lead to alterations in the myocardium. If the intima of the smaller vessels be involved, the blood current to the organs supplied is lessened, resulting in a disturbance of their nutrition.

Symptoms. Not always apparent. The symptoms vary with the arteries involved and the organs whose blood supply is lessened or cut off.

Cardiac hypertrophy from the increased resistance to the arterial circulation.

The peripheral arteries involved in the atheromatous changes can be determined by palpation, they having a hard, bony feeling, much like a whip-cord.

Attacks of vertigo, pseudo-apoplectic attacks, or spells of unconsciousness in the aged or those having superficial hardened arteries are generally due to changes in the cerebral vessels. Evidences of myocarditis and angina pectoris point to atheroma of the aorta and coronary arteries. Gangrene of the extremities in the old—senile gangrene—point to atheroma or thrombi, the result of the fibrosis.

Palpation. Hard, superficial arteries, those at the wrist feeling like a string of beads, pulsating. The cardiac impulse is forcible in the early stages.

Percussion. Increased præcordial dullness, particularly over the left ventricle.

Auscultation. In the early stages the first sound of the heart is prolonged, the second sound accentuated over the aortic cartilage. As the heart dilates and the walls become diseased, the sound becomes feeble and often irregular and intermittent.

Diagnosis. Only determined by a close study of the various symptoms and sequelæ.

Prognosis. Incurable.

Treatment. Regulate the manner of living and the diet. Prevent constipation, and torpid liver and kidneys. No remedy can remove the fibroid changes, but a very considerable experience has convinced me that much comfort and prolongation of life follows the constant use several times a day for months and years of *nitro-glycerinum*, gr. $\frac{1}{100}$ (0.00065 Gm.), and long courses of *potassii iodidum*.

ANEURISM OF THE AORTA.

Varieties. I. Aneurism of the arch of the aorta. II. Aneurism of the thoracic aorta. III. Aneurism of the abdominal aorta.

The arch of the aorta is divided by Gray into three parts—the ascending, the transverse, and the descending.

The ascending portion is two inches in length, arising from the left ventricle, on a level with the lower border of the left third costal cartilage, behind the left edge of the sternum. It ascends obliquely upward to the right to the upper border of the right second costo-sternal articulation. The transverse portion commences at the upper border of the right second sternal articulation, and, arching to the left and forward, passes in front of the trachea and œsophagus to the left of the third dorsal vertebra. The descending portion extends downward to the left side of the fourth dorsal vertebra.

The thoracic aorta extends from the left lower border of the fourth dorsal vertebra, and ends in front of the body of the twelfth dorsal vertebra, at the aortic opening in the diaphragm.

The abdominal aorta begins at the aortic opening in the diaphragm, descends a little to the left side of the vertebral column, and terminates over the body of the fourth lumbar vertebra, where it divides into the two common iliac arteries.

Definition. A circumscribed dilatation of some portion of the aorta, the result of disease of the vessel wall weakening its resistance to the blood pressure.

Causes. Those causing arterio-sclerosis are the chief causes. Exertion is an exciting cause. Aneurisms occur in early middle life rather than in old age, when the force of the heart has decreased. More common in men than in women.

Pathological Anatomy. All aneurisms may be divided into two classes, *dissecting* and *circumscribed*.

Dissecting Aneurism—false aneurism—is the result of fatty changes in the internal and middle coats of the artery. The shape may be sacculated, fusiform, or cylindrical. A disease of the aged. *Circumscribed Aneurism* may be true or false, depending on the rupture of the walls or not. It is a disease of middle life or under. Most frequent in men, usually a true dilatation. Syphilis is a very frequent cause.

ANEURISM OF THE ARCH.

Symptoms. The onset is usually gradual, with evidences of arterio-sclerosis and failing health.

Pain, either paroxysmal or constant, is a continuous symptom, with increasing *dyspnœa*. The difficulty in breathing may be constant with exacerbations, or it may be remittent. Rarely *dysphagia* occurs. A slight *cough* from pressure on the laryngeal nerve, with more or less *alterations* in the *voice*, may be present. The *pupils* are dilated or contracted or are irregular, in some cases due to pressure on the sympathetic nerve. There is a gradual loss of flesh, disorders of the circulation, and a careworn expression of the face.

Inspection. Negative until the appearance of a pulsating tumor.

Palpation. A pulsation over the tumor, expansile in character (Corrigan's sign).

If the aneurism is situated at the transverse portion of the arch, the left pulse and the left carotid are smaller and weaker than those on the right side. Tracheal tugging is a diagnostic sign (Page). "Place the patient in the erect position, with his mouth closed and chin elevated to the fullest extent. Then, on grasping the cricoid cartilage between the fingers and thumb and making gentle traction upward, the pulsations of dilated aorta or aneurism, if any exist, will be distinctly felt, in most cases transmitted through the trachea to the hand."

Percussion. Dullness, the extent depending on the size of the tumor. Dullness, other than cardiac, across the sternum is diagnostic of a mediastinal tumor.

Auscultation. Over the tumor a murmur or bruit is usually heard, synchronous with the first sound of the heart. It is louder than the systole, lower in pitch, and of a blowing character.

Diagnosis. If the tumor can be seen or felt, the diagnosis is made, its location being determined by a study of the physical signs.

ANEURISM OF THE THORACIC AORTA.

Symptoms. The most constant symptom is deep-seated thoracic *pain*, constant or paroxysmal. *Dysphagia* is a frequent condition. There is seldom dyspnœa, and alteration of voice and pupils does not occur.

Physical signs are usually wanting, and the diagnosis is rarely made during life.

I have seen three cases in which the only symptoms the patients complained of were pain of a deep-seated and boring character in the left shoulder, associated with a feeling of general fatigue. Death ensued in each of the three cases suddenly by a frightful hemorrhage from the mouth, death occurring in a few moments, and an autopsy revealed a thoracic aneurism pressing deeply in the upper left pulmonary lobe the size of a lemon, which had suddenly ruptured.

ANEURISM OF THE ABDOMINAL AORTA.

Symptoms. The chief and most constant symptom is *pain* at a circumscribed spot in the abdomen, or rarely diffused over the abdomen. Other symptoms depend upon the location of the aneurism, as they are the result of pressure. There is a gradual loss of health.

Inspection. Usually negative unless the aneurism reach an enormous size.

Palpation. A pulsating tumor in the abdomen to the left of the median line. The pulsation is synchronous with the first sound of the heart, and is *expansile* (Corrigan's sign) in character.

Percussion. Dullness may be elicited if the tumor is large and the abdomen emaciated.

Auscultation. Rarely a murmur or bruit is heard, systolic in time.

Diagnosis. Abdominal aneurism and pulsating abdominal aorta may be mistaken for each other. The point of difference is, in the aneurism, the presence of the tumor with an expansile pulsation, while in pulsating abdominal aorta, the beating is like a pulsating cord, an up-and-down movement, not expansile. The condition of the patient is also important; aneurism in males, at middle life, with changes in the vessels; abdominal pulsation occurring in nervous women or effeminate men.

Tumors located over the abdominal aorta may give rise to an apparent pulsation, causing them to be mistaken for an aneurism. The rule is, in all cases of abdominal pulsation, to place the patient in the knee-chest position; if the tumor is aneurismal, the *expansile* pulsation continues; if not an aneurism but a cancer, impacted fæces, or other tumor, the pulsation at once ceases.

Prognosis of Aortic Aneurisms. Unfavorable. The duration of life after the development of the aneurism is from one to four years.

Treatment. A persistent effort should always be made to *promote clotting* in the sac and the *contraction of the tumor.*

The so-called Tufnell's method is the most successful for this purpose, its aim being to diminish the force and rapidity of the circulation, and, if possible, to increase the fibrinous deposit. Its essential element is *absolute rest of mind and body, and a restricted diet;* the patient is kept absolutely in bed day and night for at least three months, and placed on the following diet: Breakfast—two ounces of bread with butter and two ounces of milk; dinner—two or three ounces of bread, same amount of meat, and two to four ounces of milk or claret wine; supper—two ounces of bread with butter and two ounces of milk. At the same time *potassii iodidum* is administered in increasing doses to the physiological limit.

Galvano-puncture is said to do good in some cases; two needles inserted into the aneurism are connected with the poles of a galvanic battery, and a weak current is passed through the tumor.

The various symptoms are to be met with their appropriate remedies, always having in mind the condition of the arterial wall allowing the rupture and dilatation.

DISEASES OF THE NERVOUS SYSTEM.

The diseases of the nervous system will be described under the following headings:

I. Diseases of the cerebral membranes. II. Diseases of the cerebrum. III. Diseases of the spinal cord. IV. Diseases of the nerves. V. General or nutritional diseases. VI. Mental diseases.

DISEASES OF THE CEREBRAL MEMBRANES.

The brain is invested with two membranes—the dura mater and the pia mater, or pia-arachnoid.

The *dura* lines the interior of the skull, and, in addition, supports and protects the brain. The *falx* is an extended process of the dura which extends into the longitudinal fissure; the *tentorium* is a process of the dura separating the cerebrum and the cerebellum; the *falcula* is a process of the dura extending between the two hemispheres of the cerebellum.

The blood supply for the dura is from the anterior, middle, and posterior meningeal arteries. The middle meningeal or medidural artery, a branch of the internal maxillary, is the largest of the three, and is the vessel usually involved in meningeal hemorrhage.

The nerve supply (a mooted question) is undoubtedly received from the fifth or trigeminus pair of cranial nerves, irritation of which nerve supply may produce *hyperæsthesia*, *pain*, *reflex motor*, and *vaso-motor* disturbances (Duret). The *pia* (which includes the *arachnoid*, after the suggestion of Tuke, and which Mills calls the *arachnopia*, or *pia arachnoid*) is composed of two layers—the *visceral* layer and the parietal layer. This membrane is a vascular network held by connective tissue. The *visceral* layer of the pia (formerly known as the pia alone) closely invests the brain everywhere, dipping into the fissures and into the ventricles. The *parietal* layer (formerly known as the arachnoid) closely covers the dura in all its parts.

The *pia arachnoid* is the nutritive covering of the brain, supplying a considerable section with blood. The vessels of the pia lie on the surface and are encased in perivascular sheaths composed of the denser portions of the membrane. These perivascular spaces are the lymph-canals accompanying the blood-vessels into the brain-substance and communicating with the subarachnoid spaces or cisterns.

The nerve supply of the *pia arachnoid* is still in dispute, the membrane being generally considered without sensation. This is probably an error.

The *Pacchionian* granulations are always present in abundance "on the outside of the dura, on its inner surface, on the arachnopia, and within the superior longitudinal sinus and the parasinoidal spaces, or lacs sanguinis. They often indent the calvarium, and in rare instances they penetrate it. It is generally conceded that they are enlargements of the normal villi or tuft-like elevations of the parietal layer of the pia (arachnoid). Repeated attacks of meningeal hyperæmia probably assist in their development" (Mills).

PACHYMENINGITIS.

Synonyms. Meningitis; hæmatoma of the dura mater.

Definition. Inflammation of the *dura mater;* when the external layer is primarily involved, it is termed *pachymeningitis externa;* when the internal layer is primarily involved, it is termed *pachymeningitis interna.*

Causes. *Pachymeningitis externa* is a surgical malady, resulting from fractures, penetrating wounds, and other injuries of the skull.

Pachymeningitis interna is due to blows upon the head without injury to the skull, chronic alcoholism, scurvy, Bright's disease, tuberculosis, and syphilis. Chronic internal otitis and suppurative inflammation of the orbit may cause it, and also inflammation in the venous sinuses the result of a thrombus undergoing suppurative changes. Following erysipelas, sun-stroke, and gout are recorded causes.

Pathological Anatomy. *Pachymeningitis interna.* Hyperæmia of the membrane, followed by an exudation which develops into a membranous new formation, containing a great number of vessels of considerable size, but having very thin walls. Hemorrhages from these new vessels are of frequent occurrence, which increase the size and thickness of the neo-membrane.

The usual position of the neo-membrane or new formation is on the upper surface of the hemispheres, extending downward toward the occipital lobe. The changes in the adjacent portion of the brain are dependent on the size and thickness of the neo-membrane. Bartholow observed a case in which the "cyst" was half an inch in thickness at its thickest part, and it depressed the hemisphere correspondingly, the convolutions being flattened, the sulci almost obliterated, and the ventricle lessened one-half in size.

In pachymeningitis syphilitica, the pathological lesion is in the form of gummatous tumors or masses which may degenerate and become either cheesy masses or be converted into a purulent-looking fluid.

In old age the dura mater becomes thick, cartilaginous, and of a dull white color. The sheaths of the arteries are also thickened.

Symptoms. Very obscure; principally those of cerebral pressure. Cases of persistent *headache*, *vertigo*, *photophobia*, *anorexia*, *insomnia*, gradual *impairment* of *intellect* and *locomotion*, followed by *delirium*, and *convulsions* and *coma*, or by *apoplectic attacks* and *paralysis*, occurring in the aged, or those in whom some one of the causes of the affection are present, an inflammation of the dura mater may be suspected. Epileptic attacks (dural epilepsy) sometimes occur.

Circumscribed painful œdema behind the ear and less fullness of the jugular of the corresponding side, the *phlegmasia alba dolens en miniature* of Griesinger, are indicative of thrombosis in the transverse sinus, as was first shown by Virchow.

Diagnosis. Always problematical, as the symptoms are masked and so obscure that a positive diagnosis is impossible. In very many instances the condition was not discovered until an autopsy.

Prognosis. Most unfavorable for either forms, although the course of the malady is usually slow. Surgical treatment in traumatic cases offers some hope.

Treatment. Pachymeningitis externa is to be treated surgically. Trephining is indicated in some cases. It is claimed that benefit has followed a thorough course of *potassii iodidum*. In the great majority of cases, however, all that can be done is to treat symptoms.

ACUTE LEPTOMENINGITIS.

Synonyms. Acute meningitis; cerebral fever; arachnitis.

Definition. An acute exudative inflammation of the cerebral *pia mater and arachnoid membranes* (pia arachnoid, or arachnopia), usually limited to the convexity of the cerebrum; characterized by fever, vomiting, headache, delirium, and followed by symptoms of general collapse.

Causes. During the course of the acute infectious diseases; erysipelas; associated with or a sequela of influenza and typhoid fever. Cerebral overwork; prolonged wakefulness; acute alcoholism; ex-

posure to the sun; syphilis; blows on the head; disease of the internal ear; secondary to diseases of serous membranes. Most frequent in early adult life and in young children, and in males rather than females.

"The micro-organisms found in meningitis are the pneumococcus, streptococcus pyogenes, intracellular diplococcus, the pneumo-bacillus, and a bacillus resembling that of typhoid fever" (Dana).

Pathological Anatomy. The inflammatory changes may be limited either to the *convexity* or to the *base* of the *brain*, but more frequently both portions are involved.

Intense *hyperæmia* of both membranes, followed by a purulent and fibrinous *exudation*. The ventricles may be filled with fluid, compressing and flattening the convolutions.

In twenty-five post-mortem examinations at the Philadelphia Hospital a meningo-encephalitis was present in fourteen.

Symptoms. Keeping in mind the anatomy of the cerebral membranes and the extent of surface that may be involved in an inflammation, it will be seen how varied may be the symptoms of leptomeningitis.

Prodromes: *Headache*, *vertigo*, cerebral *vomiting*, more or less *feverishness*, continuing from a few hours to one or two days, when occurs the

Stage of Invasion: Onset with a *chill*, high *fever*, 103°–104°; a *pulse* 100–120; *face flushed* with *congested eyes;* severe *headache*, most intense and continuous; ringing in the ears, *photophobia*, *vertigo*, the *nausea* aggravated; *projectile vomiting*, with *delirium;* general *hyperæsthesia* to the touch.

Stage of Excitation: General sensibility of the body, increased with sensitiveness to light and acuteness of hearing; *delirium* furious, often resembling mania; continual *jerking of the limbs*, oscillations of the eyeballs (nystagmus), twitching of the muscles of the face, followed by powerful contractions of the flexor muscles, even to the extent of opisthotonos, and in children convulsions; coated tongue, constipation and retracted abdomen. Duration, from one day to a week or two.

The finger drawn across the surface leaves a red line, the *tache cérébrale*.

Stage of Depression or Collapse; the patient gradually becomes more quiet, the delirium subsiding, as well as the muscular agitation;

somnolence develops passing into *coma*, at times temporary consciousness, coma soon following again; *pulse* irregular and slow, *fever* less; *various palsies*, such as strabismus, ptosis, pupils uninfluenced by light, mouth drawn to one side, and urine and fæces involuntarily discharged. Death following either by convulsions or by deepening coma with *cyanosis*.

Diagnosis. The characteristic symptoms indicating the existence of acute leptomeningitis are *headache*, *vomiting*, *fever*, *and delirium*, all developing rather rapidly. The headache is most persistent, and the vomiting not due to gastric trouble. The absence of any *one* of the four characteristic symptoms named above does not prove the absence of leptomeningitis, nor does the combination of delirium and fever alone determine the presence of meningeal disease.

Cerebro-spinal fever closely resembles acute leptomeningitis, the points of distinction between which are the first named occurring epidemically, associated with marked spinal symptoms and *an eruption*.

Meningitis and abscess of the brain are apt to be mistaken for each other, the differential diagnosis being pointed out in the latter disease.

The cerebral symptoms of rheumatism are differentiated from idiopathic meningitis by the association of the joint trouble.

Cerebral symptoms of typhoid and typhus fever have a close resemblance to idiopathic meningitis, and are only determined by a study of the clinical history.

In *acute uræmia* the face is turgid, œdematous, with puffiness of the eyelids; in leptomeningitis the face is pale and no œdema; uræmia has decided albuminuria; it is slight or absent in leptomeningitis; leptomeningitis has chills followed by fever; uræmia has irregular temperature record, rapidly rising to 104° F.–106° F. and dropping to 99° F., to as rapidly rise again, and usually associated with convulsions.

In *delirium tremens* the delirium is a busy one, the patient imagining persons and animals around him, and is wild in his gestures and utterances; the temperature is normal or subnormal, the skin wet and clammy. In leptomeningitis the delirium is mild but incoherent, the surface is hot and dry, and there is severe vomiting and headache.

Prognosis. Not very favorable. If recognized early and treated, a fair number of recoveries occur, but it usually leaves the patient

subject to attacks of epilepsy or with a persistent headache, and more or less mental impairment. Blindness and chronic internal hydrocephalus are rare results.

Treatment. Keeping in view the course and general prognosis of leptomeningitis, it is questionable if any very active medication will abate the disease during any stage.

Bed-rest, quiet, in a well-ventilated room, with elevation of the head, and the use of a nutritious liquid diet, with attention to all the secretions, which are markedly disordered, and the application of cold to the head for the intense headache, and meeting the symptoms as they arise in the different stages of the disease, is the safer way to manage the majority of cases of leptomeningitis. Attempts at aborting the malady are depressing to the patient in the later periods of the malady.

In vigorous or sthenic cases, with high febrile reaction and exaggeration of the early symptoms, a more or less vigorous *venesection*, or the use of *leeches* behind the ears, to the temples, or in the nuchal region, followed by the application of *cold* and the internal use of full doses of *extractum ergotæ fluidum* every couple of hours, may be used. The cerebral circulation may be markedly influenced by compression of the carotids.

For the vomiting use *chloral*, gr. iij–v (0.2–0.3 Gm.), per mouth, diluted with aquæ menthæ f℥ss (15 Cc.), repeated in half hour and p. r. n., or by enema in doses of gr. x–xv (0.6–1 Gm.). The most refractory vomiting, of whatever cause, will yield to a few doses of this drug.

If the disease show a disposition to linger, small doses of *hydrargyri chloridum mite* or *potassii iodidum* are of benefit.

Third stage: Free *stimulation*, nutritious food, *ferri iodidum*, and flying *blisters*.

TUBERCULAR MENINGITIS.

Synonyms. Basilar meningitis; acute hydrocephalus.

Definition. An inflammation of the leptomeninges (soft membranes), particularly the basal pia mater, attended with or due to the deposit of gray miliary tubercle; characterized by gradual decline of the bodily and mental powers.

Causes. Usually a secondary affection, a sequel to tubercular

disease of some other organ. Most frequently occurs in children between two and six years of age, although numerous cases are reported occurring between twenty and thirty years; scrofulous (?) diathesis; inherited diathesis. The "gelatinous children of albuminous parents," as the phrase goes, possess a special susceptibility to tubercular meningitis.

Pathological Anatomy. The deposition of tubercle usually occurs at the base of the brain.

Depositions of grayish-white granules, of a translucent, somewhat gelatinous appearance—miliary tubercle, are distributed along the vessels of the pia mater, resulting in inflammation and the exudation of lymph, with the consequent thickening and opacity of the membranes.

The cerebral tissue is not usually involved, although on section the lines indicative of blood-vessels are very much increased in number. The ventricles are distended by a clear, or milky, or even bloody serum.

Tubercular deposits occur in the lungs, intestines, and, at times, in other organs.

The presence of the tubercles alone may give rise to no symptoms until the exudative products of the resultant inflammation develop.

Symptoms. The advent is either gradual and insidious, or with convulsions, in which cases the after progress is rapid.

Prodromes: The child grows irritable, with loss of appetite, loss of flesh, swollen abdomen, constipation alternating with diarrhœa, irregular attacks of feverishness, with attacks of grinding the teeth during sleep, or *sleeplessness*. *Headache* occurs, as shown by the child, even when at play, suddenly stopping and resting its head on its hand or on the floor. Duration of this stage is from one week to a month or two.

Stage of excitation: The onset is rather sudden, with obstinate *vomiting*, severe *headache*, *convulsions; fever*, 102°–103° in the evening, falling to 99° in the morning; *pulse* soft and compressible, with irregular rhythm. On drawing the finger nail lightly over the surface a red line results, "the cerebral stain" of Trousseau. The symptoms grow progressively worse with exaltation (hyperesthesia) of the special and general senses, the least pinch or even touch causing exquisite pain; *spasmodic movements of the muscles*, with *contraction* and *rigidity*, at times *opisthotonos*. Duration of this stage is about two weeks to a month.

Stage of depression, the result of the pressure of the exudation; the *pulse* is slow and compressible, with irregular rhythm; *temperature* depressed; tendency to *somnolence* alternating with quiet *delirium*, mental stupor, continual movement of the fingers, as in picking up objects; convulsions from time to time, strabismus, oscillation of the eyeballs (nystagmus), followed by intervals of wakefulness, when the headache is excruciating, causing the peculiar, unearthly shrill cry or shriek, "the hydrocephalic cry," associated with contraction of the muscles of the face, as if suffering were experienced; finally *collapse* occurring with the "Cheyne-Stokes" respiration, the *coma* deepening, followed by death, *convulsions* often ending the scene. Duration, from a day or two to two weeks.

Diagnosis. *Acute leptomeningitis* and tubercular meningitis have closely analogous symptoms during the stage of excitation, but the history and clinical course of the two maladies determine the diagnosis.

Prognosis. Unfavorable. Usual duration, three or four weeks after fully developed prodromes. If ushered in by convulsions, the duration is shorter.

Treatment. Most unsatisfactory. No means of retarding the disease. Treat symptoms as they develop. Blisters, leeches, active purgation, pustulating ointments, *potassii iodidum*, and *hydrargyrum* are all useless.

If the hereditary tendency be marked, nutritious food, *oleum morrhuæ*, *ferri iodidum*, and *quinina* may somewhat delay the development of the affection.

DISEASES OF THE CEREBRUM.

To understand the symptoms in diseases of the nervous system, a clear and precise knowledge of the anatomy and physiology is necessary. Presuming this knowledge, only a very few of the most elementary facts will be mentioned before discussing diseases of the brain and cord.

The *nerve-cell* is the real foundation of the nervous system. It receives its nourishment from the arterioles and the lymphatics, and is drained by the venules, as are other tissues, and is supported by the connective tissue. Each nerve-cell has two processes, the *axis-cylinder process* and the *protoplasmic process;* the three—the cell and the two processes—are known as the *neurons*, the nervous system being made up of neurons. The axis-cylinder processes conduct the nerve impressions or current from the cells, and is a continuation of the axis-cylinder of the nerve. The protoplasmic process conducts the nervous current or impressions into the cell, and it is through these processes and their collaterals that the cell is brought into communication with all portions of the body. The nerve-cells—"the very inner citadel of nervous life"—are mainly set in the gray matter of the brain and the spinal cord, and the axis-cylinder processes and the protoplasmic processes run in bundles or collections in the white matter of the brain and spinal cord. The gray matter of the brain and spinal cord, or the nerve-cells, is found chiefly in the cortex of the cerebrum and the basal ganglia, the cortex of the cerebellum, in the horns of the spinal cord and the nuclei of the medulla oblongata, and all these masses of gray matter or cells are connected by nerves, or the white matter, each protected by connective tissue. The cells endow the nerves with their particular functions. A knowledge of the physiology of the nervous system is essential to understand the functions of the different masses of gray matter, or cells, and of the nerves, or white matter.

Without a knowledge of the known centers of "localization" it is impossible to interpret the symptoms of diseases of the nervous system.

A knowledge of the blood supply of the brain is of practical importance, and particularly for understanding the symptoms and pathology of apoplexy and cerebral emboli.

The external carotids on each side supply blood to the scalp, the skull, and the dura mater.

The internal carotid artery on each side and the vertebral arteries supply the brain, pia mater, and the eyes.

The internal carotid arteries divide into the anterior cerebral and the middle cerebral arteries.

The vertebral arteries on each side give off the inferior cerebellar arteries, and then join and form the basilar artery, which redivides,

forming the two posterior cerebral arteries, which, in turn, give off the posterior communicating artery. It is the uniting of these cerebral arteries by the anterior and posterior communicating arteries that forms the circle of Willis. From various portions of the circle of Willis and the beginnings of the anterior, middle, and posterior cerebral arteries are given off six groups of vessels, which furnish the blood supply to the basal ganglia and the adjacent white matter, from which they derive their name, "the central arteries of the brain." The "central arteries" given off by the middle cerebral or Sylvian artery are of the most importance to the clinician. They are known as the lenticular-optic and the lenticular-striata arteries, and are usually involved in cerebral hemorrhage.

The following centres have thus far been localized in the cortex—viz: the motor, vision, word-deafness, word-blindness, aphasia, agraphia, and muscular sense of pain and touch. The "mind" centre has been long considered as located in the frontal lobe, anterior to the motor area and the third frontal convolution, but of late the view is growing that for complete integrity of the mind the entire cortex must be intact, although lesions of the portions named produce mental symptoms only, while lesions of other portions of the cortex cause other disorders in which mental changes are more or less prominently observed.

The many symptoms resulting from diseases of the brain can be placed in four groups:

1. General symptoms of brain irritation. 2. General symptoms of brain pressure. 3. Symptoms of focal irritation or destruction. 4. Symptoms due directly to the pathological process.

Symptoms of brain irritation, or hyperæmia, are: headache, vertigo, vomiting, photophobia, mental irritability, insomnia, fullness or pressure over the brain, with scalp tenderness and noises in the ears. Rarely convulsive symptoms and delirium may occur.

Symptoms of brain pressure are: headache, vomiting, mental dullness, and frequently some form of paralysis with contracted pupil and finally coma.

Focal lesions depend upon their character: if irritative, convulsive or spasmodic phenomena if located in the motor area, and, if decided pressure or destructive lesions, paralysis, such as hemiplegia and aphasia.

The symptoms of brain lesions due to the pathological process itself

have few if any particular symptoms other than those due to the location except in abscess or gummata, when the constitutional symptoms of suppuration, such as chills, fever, sweats, and prostration, are added to other brain symptoms.

CONGESTION OF THE BRAIN.

Synonyms. Cerebral hyperæmia; cerebral congestion.

Definition. An abnormal fullness of the vessels (capillaries) of the brain: *Active*, when arterial fullness; *passive*, when venous fullness; characterized by headache, vertigo, disorders of the special senses, and, if the hyperæmia be decided, convulsions.

Causes. *Active.* Increased cardiac action, the result of hypertrophy of the left ventricle; general plethora; excesses in eating and drinking; acute alcoholism; sunstroke; prolonged mental labor; diminished amount of arterial blood in other parts, the result of the compression of the abdominal aorta or ligation of a large artery, or the suppression of an habitual bleeding hemorrhoid, are examples.

Passive. Dilatation of the right heart; pressure upon the veins returning the cerebral blood.

While congestion of the brain is not so frequent as was once supposed, the view that it cannot occur is disproven by the results following the inhalation of a full dose of amyl nitris. The relief of head symptoms after a free epistaxis and the distress resulting if it does not occur is another instance.

Pathological Anatomy. The *post-mortem* appearances are: Overloading of the venous sinuses and of the meningeal vessels, including the finer branches; the *pia mater* appears vascular and opaque; the *gray matter* of the convolutions unduly red; the *convolutions* may be compressed and the *ventricles* contracted, with the displacement of a corresponding amount of cerebro-spinal fluid.

Long-continued or repeated congestions lead to enlargement and tortuosity of all the vessels, a moist and slimy condition (œdema) of the cerebral substance, and an increase in the sub-arachnoid fluid.

Symptoms. "Rush of blood to the head" may be gradual or

sudden in its onset, the symptoms aggravated by the recumbent position. *Headache*, with paroxysmal neuralgic darts, *disorders of vision and hearing*, buzzing in the ears and sparks before the eyes, contracted pupils, *vertigo*, *blunted intellect*, inability to concentrate the mind, *irritable temper*, and curious *hallucinations*. The *face* is *red*, the *eyes congested*, and *the carotids pulsating*. The *sleep* is disturbed by *dreams* and *jerkings of the limbs*. If the attack be sudden (apoplectiform), *sudden unconsciousness* with *muscular relaxation* occur.

Cerebral hyperæmia in children often presents alarming symptoms, such as great *restlessness*, *insomnia*, *night-terrors*, *gnashing* of *the teeth* during sleep, *vomiting*, contraction of pupils followed by *general convulsions*. Any or all of these symptoms may continue more or less marked from an hour or two to a day, the child enjoying its usual health, after a sound sleep, save a feeling of fatigue.

Prognosis. *Mild cases* terminate favorably in a few hours to a day or two, but show a strong tendency to recur. *Severe cases* (apoplectiform) may terminate in health, but usually foretell cerebral hemorrhage.

The *passive* form is controlled by the lesions giving rise to it.

Treatment. *Active form:* Remove the cause if possible. *Elevate the head* and apply *cold*, either cold cloths or the ice cap; at the same time warmth to the feet. *Leeches* to the mastoid, or *cups* to the neck, or in the *apoplectiform* variety *venesection*, to diminish the intracranial blood pressure; compression of the carotids, or ligatures about the thighs, have been recommended.

An active purgation is indicated, either by *oleum tiglii*, or *magnesii sulphas*, by the mouth. The following enema is often valuable:

℞. Magnesii sulphatis, ...	℥ ij	60. Gm.	
Glycerini, ...	f ℥ j	30. Cc.	
Aquæ bul., ...	f ℥ iv	120. Cc.	M.

Sig.—Administer slowly per rectum, with little force.

In mild cases the application of an *ice cap* to the head, *sinapis* to the nucha, and *potassii bromidum*, gr. xxx–xl (2–2.6 Gm.), repeated, and the enema mentioned above, control the symptoms. *Extractum ergotæ fluidum* is strongly recommended, but its value seems to be overestimated.

In severe cases, with forcible, overacting heart, to the above means must be added *tinctura veratri viridis* or *tinctura aconiti.*

Passive form: Becomes a part of the treatment producing the stasis.

CEREBRAL ANÆMIA.

Definition. An abnormal decrease in the quantity of blood in the cerebral vessels; *general*, when the diminished supply includes all the vessels; *partial*, when the diminished supply is limited in area; characterized by pallor, headache, vertigo, some loss of power, and, rarely, convulsions.

Causes. *Partial* cerebral anæmia results from obstruction of a vessel, from embolism or thrombosis. *General* cerebral anæmia results from hemorrhages, wasting diseases, during convalescence from severe attacks of fevers, sudden shock, feeble cardiac action, and general anæmia.

Pathological Anatomy. The functional activity of the brain depends upon the quantity and quality of the blood circulating in the cerebral capillaries. Any decrease in the normal quantity or impairment in the quality produces the symptoms of cerebral anæmia. The brain is pale and milky in color, and on transverse section there are no bloody points; the ventricles and perivascular lymph-spaces are well filled with fluid.

In *partial* anæmia the local conditions differ somewhat from the above.

Symptoms. *General: Headache*, relieved by the recumbent position; *vertigo*, aggravated by exertion; general *pallor*, and anæmia with attacks of *fainting;* when the general cerebral anæmia is sudden and decided, convulsions occur.

Partial anæmia; sudden loss of power of limited muscular area, gradually returning to the normal condition.

Prognosis. Favorable in all cases save those the result of severe and repeated hemorrhages.

Treatment. Regulated *nourishment*, with *stimulants.* A certain number of hours daily in the recumbent position is of advantage. When a tendency to attacks of *swooning* exists, alcoholic stimulants or *spiritus ammoniæ aromaticus* and *spiritus ætheris compositus* every

few hours or even the cautious inhalation of *amyl nitris* are indicated. To improve the quantity or quality of the blood—

℞. Tinct. ferri chlor., ... ♏xv 1. Cc.
Acid. phosph. dil., ... ♏v .3 Cc.
Liq. arsenici chloridi, ... ♏iij .2 Cc.
Syr. limonis, ... f℥ss 2. Cc.
Syr. zingiberis, ... q. s. ad f℥ij ad 8. Cc. M.

SIG.—Every six hours, well diluted.

Or—

℞. Strychninæ sulph., ... gr. j .065 Gm.
Quininæ sulph., ... gr. xlviij 3.1 Gm.
Acid. hydrochlorici dil., . . . f℥ij 8. Cc.
Tinct. gentian. comp., ... f℥iij 90. Cc.
Tinct. card. comp., . q. s. ad f℥vj ad 180. Cc. M.

SIG.—Teaspoonful in water, after meals.

CEREBRAL HEMORRHAGE.

Synonyms. Apoplexy; "a stroke."

Definition. The sudden rupture of a cerebral vessel and escape of blood into the cerebral tissue, causing pressure and more or less destruction of the brain substance; characterized by sudden unconsciousness, irregular, noisy respiration, and complete muscular relaxation.

Causes. Rare under forty years of age. The principal cause is disease of the vessels—the development of miliary aneurisms, or a chronic endarteritis with an associated cardiac hypertrophy; hereditary tendency; Bright's disease; syphilis; alcoholic and dietary excesses,—chronic alcoholism is probably the most common cause. Apoplexy early in life is usually syphilitic. More frequent in the spring and autumn.

Pathological Anatomy. The most common locations of cerebral hemorrhage are the regions supplied by the "central arteries," the *internal capsule*, *corpus striatum*, and *thalamus opticus;* less common, the *cerebellum;* next in frequency the *pons* and *medulla oblongata*, and rarely on the *convexity* of the brain, termed *meningeal* hemorrhage.

Intracerebral hemorrhage is more common upon the right than upon the left side, and especially affects the region of the caudate

nucleus, lenticular nucleus, internal capsule, and optic thalamus; and particularly the outer border of the lenticular body, which is supplied by the striate artery,—the artery of cerebral hemorrhage. These lenticular striate arteries are branches of the Sylvian artery, and have no anastomoses.

When the hemorrhage is large, the blood may break into the ventricles and pass by the *iter* from the third to the fourth ventricle.

A recent clot is dark in color, and in consistency a soft, grumous mass, composed of coagulated blood and brain substance in varying proportions, at whose centre is the opening into the ruptured vessel. The *clot* excites inflammation around it, resulting in its being encysted, by the development of new connective tissue from the neuroglia, and then gradually absorbed, leaving a cicatrix; or the brain tissue around the clot softens and degenerates—localized softening.

Symptoms. The attack may occur suddenly as an apoplectic shock or stroke, or slowly with prodromes or "warnings."

Prodromes: Headache, vertigo, transient deafness or blindness, sensation of numbness of the extremities, with local palsies, together with the constant *dread of an attack.*

The *attack* may begin with *vomiting*, followed by either partial or complete *insensibility*, or, suddenly, the patient becoming at once unconscious and, if standing at the time, sinking to the ground completely relaxed or, rarely, with spasmodic or convulsive movements; *respiration slow*, *irregular*, and *noisy;* during the inspiration the paralyzed cheek is drawn in, and puffed out in expiration; *pulse* slow and full; *pupils* uninfluenced by light, the *face* flushed, the *eyes* congested, and the *carotids* throbbing; the *temperature* declines below the normal a degree or two, but rises within twenty-four hours to 100° F.–101° F. In fatal cases the temperature may rapidly rise to 106° F. –108° F.

The *muscular system* is profoundly relaxed, and the *reflex movements* are abolished. The head and eyes *deviate*, in many cases, *toward* the affected side in the brain *or from* the paralyzed side. Rarely convulsions occur.

Ingravescent apoplexy begins as a *mild stroke* with a rapid return to consciousness and power, except, perhaps, of speech. Headache is present with some one or more local symptoms, and in a few hours to a few days consciousness gradually becomes impaired, the loss of power again occurs, the coma deepens, the patient dying comatose.

If the unconsciousness continues longer than twenty-four hours, death is the usual termination, preceded by pale face, irregular and rapid pulse and respiration, and rise of temperature.

Reaction obtains in from a half to three hours, consciousness returning, reflex excitability reviving, associated with headache, confusion of mind, and more or less *paralysis* of motion and sensibility of one side of the body, termed *hemiplegia.*

The *electro-excitability* of the paralyzed parts is preserved.

Recovery may be delayed by inflammatory symptoms, the temperature rising to 101°–104° F., with tonic contractions (*early rigidity*) of the paralyzed muscles and severe neuralgic pains.

Localization of the lesion of a cerebral hemorrhage is of great practical importance.

Capsular hemorrhage or of the internal capsule at the anterior portion around the genu (knee), where the motor fibres pass and converge coming from the hemispheres, is a frequent site, causing loss of consciousness of sudden or rapid onset, hemiplegia, involving face, arm, and leg, with motor aphasia if the hemiplegia be on the right side. There is also a unilateral loss of reflex action, conjugate deviation of the eyes from the paralyzed side, and unilateral defective movement with flaccidity of the limbs.

Cortical hemorrhage, localized unilateral paralysis of the face, the arm, or the leg, with local convulsions or convulsions that have a local beginning, or profound unconsciousness.

Centrum ovale hemorrhages resemble the cortical with the local convulsions.

Crus-cerebri hemorrhage, loss of consciousness with hemiplegia involving the lower half of the face and the limbs, with paralysis of the third nerve on the opposite side, or the side of the lesion. The unilateral third nerve symptoms are ptosis, external strabismus, dilatation of the pupil, and loss of accommodation for near objects. The paralysis is termed "crossed" or "alternate" hemiplegia.

Pons hemorrhage causes either general convulsions or irregular convulsions in the legs, bilateral motor paralysis, bilateral anæsthesia, either contracted or dilated pupils, embarrassed respiration, repeated non-gastric vomiting, and high temperature. If the hemorrhage is large, death is sudden or within a few hours, and even if small, the prognosis is unfavorable.

Ventricular hemorrhages are generally of the *ingravescent* variety,

and are characterized by a second apoplectic seizure soon after the first, with extension of the hemiplegic symptoms or a relaxation of the muscles from one side to both sides of the body.

Cerebellar hemorrhages vary so greatly in the symptoms that a positive diagnosis can seldom be made.

Meningeal or *dural hemorrhage* is usually due to a trauma. Two varieties: I. *Infantile meningeal hemorrhage*, occurring during labor. II. *Extra-dural hemorrhage*, the result of direct injury to the head.

The infantile variety presents symptoms of irritation and compression of the cortex, such as convulsions, general or unilateral; rigidity, opisthotonos, and either hemiplegia or diplegia.

The extra-dural variety is almost always the result of fracture or trauma of the skull, resulting in an extravasation of blood between the dura and the skull from the middle meningeal artery; the hemorrhage may be on one or both sides. The symptoms may develop at once or after some days, and are those of pressure; hemiplegia, partial or complete; convulsions, impaired or absent reflexes, dilatation with loss of reaction of pupil of opposite side; stupor, gradually deepening into coma and death.

Sequelæ. *Paralysis* of the muscles of the face, tongue, body, and extremities of one side, *opposite* to the location of the hemorrhage, termed *unilateral* paralysis or *right* or *left hemiplegia*.

Paralysis of both sides of the body, due to simultaneous hemorrhage on *both* sides, termed *bilateral hemiplegia*, or *diplegia*.

Paralysis of *one* side of the face and of the extremities of the opposite side, due to hemorrhage into the *pons Varolii*, termed *alternating* or *crossed paralysis*.

Occasionally *tonic contractions* occur in muscles long paralyzed, termed *late rigidity*, and is evidence of a *secondary degeneration* of the nerve fibres.

Choreic movements in paralyzed muscles are termed *post-hemiplegic chorea*, due, according to Charcot, to changes in the motor centres.

The *mental powers* are always more or less permanently impaired, the patient irritable and emotional, and the same holds good concerning the *memory*.

Diagnosis. The diagnosis of the apoplectic seizure is often one of the most difficult questions in medicine, and yet of the greatest

importance, as the treatment depends upon its correctness. The diagnosis of the sequelæ is comparatively easy.

Insensibility from drink differs from apoplexy in the following points: insensibility is not so complete, no drawing in and puffing out of one cheek with respiration, the pulse frequent instead of slow, the pupils influenced by light; upon raising both legs, no difference is apparent on allowing them to drop; the eyes and head are not turned to one side, and, lastly, the condition is ameliorated on the inhalation of ammonia. Dr. von Wedekind's test for temulence is generally satisfactory: "By simply pressing on the supraorbital notches with a steadily increasing force you may, with certainty of success, bring an unconscious alcoholic to his senses, and thus differentiate between alcoholic and other comas."

Opium poisoning differs from apoplexy by the gradual approach of the coma, the contracted pupil and slow pulse, and quiet, slow respiration, and that the patient can be momentarily aroused, and also by the absence of the heavy stertor of apoplexy.

Uræmia causes a coma that closely resembles apoplexy. A history of Bright's disease at once clears up the case; again, uræmic coma is generally preceded by convulsions; a rapid rise of temperature, as shown by the thermometer, often 104° F. to 106° F., while to the hand the surface appears but little, if at all, above the normal; the pulse is usually weak with irregular force, the respirations averaging twenty-five to thirty per minute, the face having a glossy appearance.

Cerebral embolism cannot always be differentiated from apoplexy. We may suspect cerebral plugging if the patient be young; if he be laboring under acute or chronic cardiac valvular trouble; if, within brief periods, several incomplete attacks have occurred before a complete comatose condition obtains; or, if hemiplegia results with passing or slight unconsciousness; or, if the phenomena are sooner or later followed by cerebral softening, as embolism and thrombosis are the most common causes of softening.

Syncope or a fainting-fit is of sudden onset, but, being due to a failure of the circulation, the pulse is feeble, the face pale, the respirations quiet, and the duration of unconsciousness short, all the very opposite of an apoplectic attack.

Prognosis. If the patient survive the immediate effects of a cerebral hemorrhage, he is always in danger of a new attack, since the causes of the original attack still remain. Another attack

or two is the usual course, a fatal termination ultimately occurring. If the attack be due to or associated with Bright's disease, recovery is rare.

The *hemiplegia* is uncertain; a partial recovery may occur within a few months or it may continue for years.

Treatment. If there are prodromal indications, the most prompt means of reducing the intracranial blood pressure is by *venesection*, followed by a brisk purgative, which may be aided by an immediate enema:

℞. Magnesii sulph., ...	℥ ij	60. Gm.
Glycerini, ...	f℥ j	30. Cc.
Aquæ bullæ, ...	f℥ iij	90. Cc.

SIG.—Administer by bowel slowly without force.

If the patient be weak, however, *leeches* to the mastoid, and *potassii bromidum*, gr. xl–lx (2.6–4 Gm.), or *extractum ergotæ fluidum*, f℥ss–j (2–4 Cc.), may be substituted.

For the *attack*, loosen clothing, elevate the head, remove constrictions, place in a cool room, have perfect quiet, placing the patient sufficiently on his side, with the face somewhat downward, for the tongue and palate and secretions to fall forward instead of backward into the pharynx, and at once *venesection*, *cold to head*, *a mustard foot bath*, and *oleum tiglii*, ♏j–iij (0.06–0.2 Cc.), with *glycerinum*, ♏ xv (1 Cc.), placed on back of tongue; if the pulse be full and strong, when consciousness is regained, either *tinctura veratri viridis* or *tinctura aconiti* is indicated.

If during the attack the *face be pallid* and the *pulse irregular*, and the patient is prostrated by the *shock*, *stimulants* and *digitalis* are indicated, with, perhaps, *leeches* to the mastoid and an *enema of terebinthina*.

For the secondary fever, either *tinctura aconiti* or *tinctura veratri viridis*; for the headache and delirium, *camphoræ bromidum*.

For promoting the *absorption* of the clot, keep the secretions active, a good diet and a course of *potassii iodidum* or *hydrargyri chloridum corrosivum*, alternated with—

℞. Liq. potassii arsenit., ...	♏ v	.3 Cc.
Syr. calcii lacto-phosph., . . .	f℥ ij	8. Cc.

Three times a day.

After two or three months a weak *galvanic current* applied directly

to the brain, by placing an electrode on each mastoid process, promotes absorption.

For the *paralyzed muscles*, the *faradic current*, applied by placing one electrode over or near the nerve innervating the muscle and the other over its belly, acts as a tonic, preventing wasting; it is assisted by hypodermic injections into the paralyzed muscles of *strychninæ sulphas*, gr. $\frac{1}{60}$ (0.001 Gm.), four times a week.

CEREBRAL THROMBOSIS AND EMBOLISM.

Synonyms. Partial cerebral anæmia; occlusion of cerebral vessels; cerebral apoplexy (?).

Definition. The occlusion of a cerebral vessel, from the formation of a *thrombus* or the presence of an *embolus*, thus causing *anæmia* of some portion of the brain; characterized by the gradual—when the result of thrombosis, and the sudden, when due to embolism—development of headache, vertigo, disorders of intelligence, with more or less complete insensibility and paralysis.

Causes. *Thrombosis*, or the formation of a clot in the vessel,—an *ante-mortem* coagulation,—is almost always the result of chronic endarteritis, as seen in the aged, together with a slowing and weakening of the blood current. Chronic alcoholism and syphilis are the usual causes when occurring in young adults.

Emboli, in the great majority of instances, result from an endocarditis—cardiac emboli; small particles of the exudation being carried into the circulation and deposited in the brain. Emboli may also be derived from an aortic aneurism or syphiloma of the great vessels.

Pathological Anatomy. The cerebral arteries may be obstructed by emboli or thrombi: the cerebral veins and sinuses by thrombi only. The changes in the cerebral tissue are those of anæmia of the part or parts supplied by the occluded vessels. The subsequent changes depend upon the anatomy of the vessels. If the obstructed artery has anastomoses, the collateral circulation is soon established and the brain tissue assumes its normal condition. If, on the other hand, the occluded vessel be one of "Cohnheim's terminal arteries,"—arteries without anastomoses, such as the lenticular-optic and the lenticular-striate set of arteries, branches of the Sylvian artery,—the blood in the whole extent of the occluded vessels coagulates, thus preventing the backward flow of blood from the surrounding

capillaries and so obstructing collateral circulation, whence the anæmic tissue dies or undergoes *necrobiosis*, followed by yellowish-white softening; or, if the vessel beyond the seat of the occlusion remains pervious, blood flows back through the capillaries from the nearest artery or vein, the parts that a short time before were bloodless, now become deeply engorged, the succeeding changes in the vessels permitting *diapedesis* of the red blood globules. The tissues which are undergoing disintegration are colored by the red globules, causing the appearance entitled "red softening," which after some weeks becomes "yellow softening," finally changing to "white softening," when there is a milky, or rather creamy fluid mixed with masses or particles of broken-down nerve elements.

The vessel most commonly occluded is the *left middle cerebral artery*, which sends branches to the second and third frontal convolutions, the anterior and superior portions of the three temporal convolutions, the island of Reil, the parietal convolutions, part of the external and all of the internal capsule, the lenticular nucleus, and most of the corpus striatum,—the *motor centres*.

Symptoms. Two distinct modes of onset: Gradual, when the result of thrombosis; sudden or apoplectic, when due to embolism.

Cerebral thrombosis: Most common in the aged. Persistent *headache* and *vertigo*, at one time severe and at another mild. Next, alterations in the patient's character; *irritable*, *morose*, and *despondent*, with periods of *absent-mindedness*, *disorders of vision*, and *impairment of memory*, *speech* becoming *hesitating* and mumbling. *Impaired locomotion*, the result of the vertigo, and of *muscular weakness* and *trembling*, followed sooner or later by *hemiplegia*, which may be preceded by sudden insensibility or occur gradually, the symptoms slowly proceeding to *dementia* and death from exhaustion; or, rarely, the symptoms are not so grave, and partial or complete recovery occurs after the hemiplegia, from establishment of the "collateral circulation."

Cerebral embolism. The symptoms are sudden, but either mild or grave in character.

Mild variety; sudden and severe *vertigo*, *confusion of mind*, *muscular twitchings*, usually one-sided, and *vomiting*, followed by *hemiplegia*, most frequently of the right side, the intellect clear but hesitating. After some weeks or months the paralysis usually disappears and recovery is complete.

Grave or *apoplectic variety*. *Sudden headache, vertigo, flushing* or *pallor* of the *face*, or the patient may utter a *sharp cry*, fall to the ground with *sudden unconsciousness* and *complete muscular relaxation*, followed by death or a gradual return of consciousness with *hemiplegia*, which is generally right-sided, with aphasia, remaining for several weeks or months, or is persistent, the *mind remaining normal* or *enfeebled* and the *emotional nature* highly excitable and the *reason* and *judgment clouded*, continuing thus for years, or gradually developing into *dementia*, exhaustion, and death.

The following are some of the symptoms of "localization" if particular vessels are blocked:

Vertebral artery, the left most frequently, results in acute bulbar paralysis from involvement of the nuclei in the medulla, associated or not with hemiplegia.

Basilar artery causes diplegia with bulbar symptoms. There is rapid rise of temperature. Death follows within a day or two, or suddenly, if the respiratory centres are involved.

Middle cerebral artery or one of its branches is the most frequent seat of embolic or thrombotic occlusions. The symptoms depend upon the exact branch involved; if plugged before the central arteries are given off, the internal capsule is deprived of its blood supply and permanent hemiplegia may follow; if the blocking is in the central branches, the hemiplegia involves the arm and face, and if the left side, aphasia occurs. The individual branches passing to the third frontal (aphasia), the ascending parietal (hemiplegia, particularly hand), supra-marginal and angular gyri (word blindness), and the temporal gyri (word deafness), may be plugged.

Duration. *Thrombosis*, essentially an affection of the elderly, and has a chronic course. Months and years may be occupied with the various symptoms until the phenomena of secondary dementia develop.

Embolism is of sudden onset, and may be followed by a rapid recovery.

Diagnosis.—Thrombosis is associated with changes in the vessels, the arcus senilis, and other evidences of senile degeneration.

Embolism may be mistaken for cerebral apoplexy, and, while a positive differentiation cannot always be made, an important point to be considered is the presence of cardiac murmurs.

Prognosis. Thrombosis is a permanent and progressive condition in the majority of instances. Recovery is a rare termination.

Embolism may be followed by a perfect recovery. Usually, however, some evidences of the plugging remain permanently. Death may be the result within a day or two, from the plugging of a large vessel, the patient never emerging from the coma. In other cases the patient arouses from the coma, the hemiplegia with aphasia persisting, and the case pursues the usual course of localized cerebral softening.

Treatment. The indication in the early stage of embolism and thrombosis is the re-establishment of the circulation within the area deprived of its blood supply, in order to prevent the changes incident to defective nutrition; this is accomplished by measures to strengthen the heart's action, tonics, perfect rest for some time after the attack, a plain but nutritious diet, and attention to the various secretions.

Prof. Bartholow "has had remarkable results from the following plan of treatment in thrombosis": *Ammonii carbonas*, gr. x (0.6 Gm.), with *ammonii iodidum*, gr. v (0.3 Gm.), three times a day, continued for several months, "the object being dual—to increase the action of the heart and arteries, and to effect a solution of thrombi forming by maintaining the alkalinity of the blood."

In the aged, presenting indications of degeneration, much benefit results from the use of—

℞. Liquor. potassii arsenitis, . . . ♏iij .2 Cc.
Syr. calcii lacto-phosphat., . . . f℥ij 8. Cc. M.
Sig.—After meals, well diluted.

It may be combined with *oleum morrhuæ* with decided advantage.

For *embolism*, the immediate and persistent use of the following may dissolve the plug:

℞. Ammonii carbonat., ... gr. v .3 Gm.
Liquor. ammonii acetatis, . . . f℥j 4. Cc. M.
Sig.—Three or four times daily, well diluted.

"In a month or two a very light galvanic current (from two cups) may be passed through the brain in both directions" (Bartholow).

CEREBRAL ABSCESS.

Synonyms. Acute encephalitis; suppurative encephalitis.

Definition. An acute suppurative inflammation of the brain structure, either localized or diffused, primary or secondary; characterized by impairment of intellect, sensation, and motion.

Causes. *Primary cerebral* abscess is exceedingly rare. Pyæmia; glanders; embolus from ulcerative endocarditis.

Secondary cerebral abscesses result from injuries to the cerebral tissues, following apoplexy, embolism, thrombosis, and injuries to the cranial bones. Chronic suppurative otitis; chronic suppuration in some other portion of the body.

Pathological Anatomy. Abscesses of the brain may be single or multiple, varying in size from an almond to an egg.

It occupies a limited and well-defined region of the cerebral tissue, such as either the corpora striata, optic thalami, gray matter of the cortex, the cerebellum, or the white matter of the hemispheres.

Cerebral abscesses are usually due to micro-organisms. Abscesses are more frequent in the right hemisphere than the left. When the result of pyæmia or infection from distant organs, such as the lungs, they are generally multiple. When secondary to disease of the ear, frontal sinuses, naso-pharynx, or trauma, they are generally single.

An abscess having developed, steadily increases in size, encroaching upon the surrounding brain, and usually the brain tissue forms a defensive wall about the abscess—a capsule or pyogenic membrane. The incapsulated abscess continues to develop, finally bursting, infiltrates the surrounding tissue with consequent pressure, or discharges into the meshes of the pia arachnoid, on the cortex or into the lateral ventricles. Rarely, an incapsulated abscess may become permanently encysted. The pus of cerebral abscess is greenish or greenish-yellow in color and fœtid (Dercum).

Symptoms. A concise description of the symptoms of abscess of the brain is very difficult, on account of the wide variations dependent on its location, and also the difficulty of isolating it from the affections to which it is secondary.

The onset varies according to the cause, although all cases are associated with headache, irritative fever, vomiting, persistent and spreading paralysis, convulsions, optic neuritis, mental apathy, delirium, and coma.

If following apoplexy, thrombosis, or emboli, there occurs fever and delirium, the paralysis remaining and spreading with spasmodic contractions of the affected muscles.

If secondary to a chronic ear disease, there is following sudden stoppage of the ear discharge; *severe pain* in ear and side of head, accompanied with chill, fever, vomiting, followed in a few days by the disap-

pearance of febrile symptoms and the development of a condition of stupor, with cerebral symptoms, depending upon the location of the abscess.

Occasionally cases run a chronic course, the onset rather insidious; dull, persistent headache; changed disposition, peevish, irritable, unreliable, with decline of moral sensibility; easily fatigued by mental work; inability to stand exertion; memory impaired; vertigo; dyspepsia, soon followed by slight palsies, which progressively increase, becoming general, with involuntary discharges, death following from exhaustion.

Of the focal symptoms, hemiplegia, of incomplete character, occurs in about one-half of all cases of abscess of the brain. A very constant symptom of diagnostic value, when hemiplegia is very marked, is *exaggerated knee-jerk* with pronounced *ankle clonus*.

Diagnosis. A positive diagnosis is only possible by a close study of the causes and the clinical history, as the symptoms at times indicate meningitis and again cerebral tumor.

Purulent meningitis may follow trauma to the brain or chronic ear disease, making the diagnosis impossible. The chief points of distinction are: The subacute or chronic course of abscess, slight involvement of cranial nerves, hemiplegia, and the presence of an active, persistent, unilateral ankle clonus and exaggerated knee-jerk on paralyzed side.

Prognosis. The usual termination is in death. The course depends upon the character and extent of the injury, varying from a few days to several months.

Treatment. Surgical treatment has been attended with marked success in some cases of abscess of the brain, the withdrawal of the pus being followed by recovery. For traumatic abscess the operation of trephining is indicated. Symptomatic treatment for relief of the various symptoms as they arise.

INTRA-CRANIAL TUMOR.

Synonym. Cerebral tumors.

Definition. Tumor of the brain is either a growth in the cerebral tissue, on the meninges, or in the vessels; characterized by symptoms of pressure upon the brain structure.

Causes. Injuries to the head; syphilis; changes in the vessels; tubercle and cancer; heredity.

Pathological Anatomy. The size of tumors varies, and they may become as large as an orange before they will give rise to symptoms.

Tumors of the brain are of various kinds—to wit: *vascular tumors*—aneurisms; *parasitic tumors*—cysticercus; *diathetic tumors*—tubercle or syphilis; *accidental tumors*—glioma.

Whatever the character of the growth, it produces irritation of the surrounding parts, and by pressure, destruction of the tissues, or interferes with the arterial or venous supply.

Symptoms. Those common to tumors in general are: *Headache*, persistent and increasing in intensity; *defects of vision*, even blindness, due to an optic neuritis, a very constant symptom; *defects of hearing*, *taste*, and of *speech*, the result of paresis of the vocal cords; *vertigo*, associated with nausea and *vomiting; convulsions*, epileptiform in character, usually limited to one side of the body, occurring at regular intervals, or confined to the eyeballs (nystagmus) or one limb, with *no loss of consciousness; palsies*, beginning first as strabismus, ptosis, and dilatation of the pupil, of the facial muscles, paraplegia and general hemiplegia; defects of sensibility, such as sensations of numbness and coldness in the limbs and body. Occasionally disturbances of equilibrium, manifested by a tendency to go backward or turn to the right or left; intellectual faculties well preserved until late in the affection, when the memory becomes impaired or lost for certain articles, and finally a gradually advancing dementia.

Diagnosis. Rarely can a positive diagnosis be made. The following points will aid: Long-continued persistent headache, without appreciable cause; epileptiform convulsions, unilateral, without loss of consciousness; difficulty of vision, hearing, and speech, associated with nausea and vomiting, and local and general palsies.

The location of the tumor may be determined by the more or less pronounced character of certain symptoms.

The diagnosis of the character of the growth can only be determined by a close study of the history.

According to Herter, the indications that suggest that the tumor is a *syphilitic growth* are as follows: Syphilitic history; symptoms of irritative disease of cortex rather than destructive evidences of rapid growth at the onset, followed by a period of slow progress or stationary symptoms; gradual improvement under anti-syphilitic treatment; development between twenty and forty-five years of age.

Indications suggesting *tubercular growth* are: Family history of or tuberculosis in some other organ of the patient; rapid development of symptoms; indications of the growth in the cerebellum or in the pons; early appearance of the symptoms, especially before the tenth year, and history of injury to head.

Indications suggesting *sarcoma* or cancer are: The presence of a sarcoma elsewhere and rapidly failing health, with cerebral tumor symptoms in patient over fifty years.

Indications suggesting *glioma:* Sudden loss of consciousness with exacerbation of all symptoms in the clinical history of cerebral tumor; cortex irritative symptoms as in syphiloma, developing under fifty years of age, and the absence of all evidences of tubercle, syphilis, sarcoma, and cancer.

The *focal* symptoms of intracranial tumors are so important in diagnosis that the following summary is given of symptoms caused by brain tumors:

Prefrontal region. Mental impairment; pressure in central region, causing aphasia, Jacksonian epilepsy, and disturbances of smell.

Central region. Motor aphasia, monoplegia, partial anæsthesia, Jacksonian epilepsy.

Posterior parietal region. Word-blindness, homonymous hemianopsia, disturbed muscular sense.

Corpus callosum. Progressive hemiplegia.

Crus cerebri. Crossed paralyses of oculo-motor nerve and limbs.

Corpora quadrigemina. Oculo-motor paralyses, reeling gait, possibly blindness and deafness.

Pons and medulla. Crossed paralysis of face and limbs, or tongue and limbs. Other lesions in cranial nerves.

Cerebellum. Marked cerebellar ataxia, vomiting, convulsions, coma.

Base, anterior fossa. Mental enfeeblement, and disturbances of smell and vision, exophthalmos.

Base, middle fossa. Impairment of vision; hemiplegia; oculo-motor disturbances.

Base, posterior fossa. Trigeminal neuralgia; neuro-paralytic ophthalmia; paralysis of the face and tongue; impaired hearing; crossed paralyses.

Diagnosis between cerebral tumor and abscess. Both may have any or all of the following symptoms: Headache, vomiting, double optic neuritis, and mental failure. Tumor has, in addition, marked

focal symptoms, monoplegia, hemiplegia, paralysis of cranial nerves, and marked optic neuritis; the absence of these favor abscess, or if hemiplegia, the ankle clonus and knee-jerk is exaggerated. Fever and rigors point to abscess. The causes of abscess are very clear, those of tumor often uncertain.

Prognosis. Unless of syphilitic origin, unfavorable; but it is to be borne in mind that all syphilitic tumors of the brain do not have a favorable termination.

Treatment. Unsatisfactory. Mostly symptomatic. As benefit occasionally follows the use of *potassii iodidum*, gr. xx (1.3 Gm.), three times a day, or *ext. ergotæ fld.*, f℥ss–j (2–4 Cc.), three times a day, continued until their physiological effects are produced, these remedies should be used in all cases, discontinuing them if no benefit follow.

The surgical treatment of tumors of the brain was given a great impetus from the report of the case operated upon in the practice of Hughes-Bennet. The surgical treatment is promising for the future.

APHASIA.

Definition. Aphasia is a symptom and not a disease. A loss of memory for words. The loss, partial or complete, of the power of expression or comprehension of language.

Amnesic aphasia, or loss of the memory of words by which ideas are expressed.

Ataxic aphasia, the inability to combine the different parts of the vocal apparatus for vocal expression, although the memory of words still remains, so that the afflicted person can write his ideas intelligently.

Agraphia, the inability to recognize and make signs by which ideas are communicated in written language.

Amnesic agraphia, the inability to combine the muscular apparatus —"writers' cramp."

Paraphasia, the mental state in which the wrong words are used to express the idea.

Paragraphia, the state in which wrong or meaningless written signs are used to express the idea.

Pathological Anatomy. The distinction between aphasia and aphonia must be clearly determined.

Aphasia is not the result of any one specific lesion, but occurs during the course of several—to wit: Occlusion of certain cerebral vessels; cerebral hemorrhage; cerebral abscess or softening; meningitis; tumors; mental or moral causes; hysteria (?).

It is now almost definitely determined that lesions of the left middle cerebral artery, island of Reil, third frontal convolution, and parts of the corpus striatum are associated in the production of aphasia. The lesions are usually upon the left side of the brain, the aphasia being often associated with right hemiplegia.

Symptoms. The degree to which articulate language is impaired varies from the loss of a few words to complete inability to communicate ideas. The intellect does not suffer in proportion to the loss of words; for, showing the individual an article, while he may miscall it, if you call it by name he will recognize it. This inability to convey thoughts is a source of great mental suffering, in some leading to a suicidal tendency.

A strange clinical fact is the strong tendency to profanity shown by aphasic patients.

Diagnosis. *Aphonia*, or loss of voice, should not be confounded with aphasia, or the inability to remember words.

Paralysis of the tongue, or inability to move this organ, thereby interfering with articulate language, should not be confounded with aphasia, which, as a rule, is not associated with paralysis of the tongue.

Prognosis. Controlled entirely by the cause. If the result of congestion of the brain or a syphilitic tumor, the prognosis is favorable. If associated with hemiplegia, the clot may undergo absorption, and recovery follow. If associated with softening of the brain, however, the disease grows progressively worse.

Treatment. Depends upon the cause, which must be energetically treated, as the aphasia pursues a course parallel to the associated malady. Cases not associated with cerebral softening have regained the memory of words by a course of carefully conducted speech lessons.

Cases of aphasia of sudden occurrence are strongly diagnostic of injury due to a spicula of bone if a history of a head wound, or from the pressure of a clot, and the operation of trephining may be of benefit.

VERTIGO.

Synonym. Dizziness.

Definition. Vertigo, or dizziness, is a subjective state, in which the individual affected (subjective vertigo), or the objects about him (objective vertigo), seem to be in rapid motion, either of a rotary, circular, or to-and-fro character.

Causes. The etiology of an attack of vertigo depends upon the particular variety.

Ocular vertigo results from the paresis of one or more of the ocular muscles, eye-strain, or astigmatism.

Aural or auditory vertigo, or *Ménière's* disease, results from disease of the semicircular canals and cochlea. Ménière's disease, properly so called, is a sudden severe vertigo, the result of either a hemorrhage or a serous or purulent exudation into the semicircular canals.

Gastric vertigo is the most common variety, and results from either stomachic or intestinal dyspepsia, disordered hepatic function, or constipation. "The mechanism of the vertigo is complex. There are two factors: one consists in the toxic effect of the imperfectly oxidized materials which accumulate in the blood; the other is reflex. An impression made on the end organs of the pneumogastric in the stomach is reflected over the sympathetic ganglia" (Bartholow).

Nervous vertigo is associated with migraine, sick or nervous headache, and is also caused by physical or nervous excesses, also by the immoderate use of tea, coffee, alcohol, and tobacco. It is also a result of many of the organic diseases of the brain.

Senile vertigo is the result of the disordered cerebral circulation resulting from senile changes in the heart and vessels.

Symptoms. In all varieties of vertigo the symptom of a *sensation of objects moving around the patient*, or *the patient moving around objects* which remain stationary, is present in some degree. The attack of *giddiness* comes on suddenly, with an indistinctness of vision and slight confusion of the thoughts. The patient may fall unless he grasps something to steady himself. *Nausea* and *vomiting* and *cardiac palpitation* with *tinnitus aurium* are often associated with the vertiginous sensations. *There is no loss of consciousness.*

In the ocular vertigo the attack is usually the result of reading, writing, sewing, or other close application of the eyes, the ordinary

symptoms of vertigo being preceded by headache, nausea, specks before the eyes, and pain in the eyeballs.

In *Ménière's disease* the vertigo is associated with serious *tinnitus aurium*, and the vertiginous sensations are of various forms, such as a see-saw movement, a gyratory motion, right or left; a vertical whirl, or a sensation of rising and falling like unto the swell of the ocean. The symptoms are of long duration, becoming marked in paroxysms. The attack of aggravated vertigo is so sudden and overwhelming at times that the person is suddenly thrown to the ground as if struck with a blow, and is associated with nausea and vomiting. As the condition continues, the character of the individual changes, becoming morose, irritable, and suspicious.

Not all cases of Ménière's disease become permanent, but it may occur in isolated attacks, the interval being free from all sensations.

Gastric vertigo is by far the most frequent variety. Persons subject to vertigo of this kind live in constant dread of cerebral disease, which fear frequently results in true melancholia.

The vertiginous sensations usually occur during the course of well-marked and long-standing stomach and intestinal disorders, such as pain or oppression after meals, nausea, pyrosis, heartburn, frequent eructations, and constipation or, rarely, diarrhœa. The abdomen is often distended with flatus. Great pain in the nucha is a very frequent occurrence. The attack may be associated with either hyperæmia or anæmia of the brain. The symptoms are not constant, but recur at intervals, sometimes remote, at others very close to each other.

In *nervous vertigo* the vertiginous symptoms are usually associated with more or less irritability of temper, restlessness, and insomnia. The onset is sudden, after some one of the etiological factors. In megrim there are headache, nausea, and vomiting. This form of vertigo often precedes or replaces the epileptic convulsion. And it also often precedes softening of the brain.

In *senile vertigo* the vertiginous symptoms are the result of anæmia of the brain. The attacks are developed by any exertion, often by merely assuming the erect posture. There is a swimming sensation in the head, darkness falls on the eyes, with a sensation of chilliness and prostration.

Diagnosis. The diagnosis of the various forms of vertigo can only be determined after a close study of the history and course of

the attack. The existence of organic cerebral disease must always be kept in mind in solving any case.

Prognosis. This will be influenced by the variety of the vertigo. The prognosis is favorable in ocular and gastric vertigo. Unless the result of organic disease, the prognosis is good in nervous vertigo. In auricular vertigo the prognosis is fair, but in genuine Ménière's disease the prognosis is unfavorable, as it is also in senile vertigo.

Treatment. For ocular vertigo, rest for the eyes and properly adjusted glasses.

For cases of Ménière's disease, rest in the recumbent position and the use of full doses of *quininæ sulphas*, gr. x–xv (0.6–1 Gm.), daily until cinchonism occur, then omiting the drug until these effects disappear, and if no improvement is observed, begin another course, and so on as suggested by Charcot.

For gastric vertigo a careful regulation of the diet. At the beginning of the treatment it is often of great advantage to place the patient on an exclusively milk diet, gradually widening the variety as improvement occurs. In these cases a course of *arsenicum* is often serviceable. If the digestion be torpid, the use of *tinctura nucis vomicæ* is indicated. If the bowels are constipated, benefit is obtained from *extractum cascaræ sagradæ fluidum.*

℞.	Ext. cascaræ sagr. fld., ... f℥j	30. Cc.	
	Glycerini, ... f℥j	30. Cc.	
	Tinct. card. comp., ... f℥ss	15. Cc.	
	Aquæ menthæ pip., ... f℥ss	15. Cc.	M.

Sig.—One teaspoonful three times daily, well diluted.

For nervous vertigo the removal of the exciting cause and the use of such remedies as *ferrum*, *quinina*, and *strychnina*, either alone or variously combined.

For senile vertigo, a highly nutritious but easily digested diet, the use of a good *spiritus frumenti* and a course of *hydrargyri chloridum corrosivum*, or *arsenicum* with *tinctura nucis vomicæ*, or a long course of *spiritus glonoini*. Prevent flatulency and constipation.

In all varieties of vertigo the habits of the patient must be most abstemious, excluding tobacco, tea, coffee, highly seasoned foods, malt liquors, and alcohol, unless particularly indicated.

MIGRAINE.

Synonyms. Megrim; hemicrania; sick headache; bilious headache; blind headache.

Definition. A unilateral paroxysmal pain in the head, periodical, accompanied by nausea, often vomiting, intolerance of light and sound and incapability of mental exertion, the brain for the time being temporarily prostrated and disturbed.

Causes. In the majority of patients the nervous predisposition to migraine is inherited, but whether inherited or acquired, it commonly develops about puberty. It is more common in women than in men.

Among the many exciting causes are disturbances of digestion, irritation of the ovaries or uterus, worry, exacting mental labor, sexual excesses and insufficient sleep, or eye strain. The causes of many attacks, however, are wrapped in mystery, as with the best of care the attacks seem to have a periodical course.

Symptoms. Attacks of migraine occur in irregular paroxysms, the intervals between being free from pain or nervous disturbance.

For a day or two preceding the paroxysm it will be ascertained that there was a feeling of fatigue or mental depression without apparent cause, heaviness over the eyes, with some flatulency and indigestion.

The attack proper is ushered in by *chilliness*, *yawning*, *nausea*, often *vomiting*, and general *muscular soreness*, with *intolerance of light*, flashes before the eyes, and often phantasms, and *noises in the ears* with *incapability for mental exertion*, *vertigo*, and *pain* of a *sharp*, *shooting* character, of *great intensity* and persistency, localized most frequently in either the frontal, temporal, or occipital regions of the left side; at the same time there is tenderness over the whole side of the head. Rarely the pain is felt on the right side, and still more rarely on both sides at the same time. The nausea and other digestive symptoms may follow the onset of the pain instead of preceding it.

There is more or less disturbance of the circulation, temperature, and secretions of the painful parts. At times there is a marked contraction of the vessels, with the face pale, the eyes shrunken, and the

pupils dilated; again, the vessels may be dilated, when the face is flushed, the conjunctivæ injected, and the pupils contracted.

The urine before, during, and after a paroxysm is concentrated, and it may be that the excretion of uric acid is associated with the etiology of migraine.

Motion, sound, and light aggravate the acute suffering.

The attack may continue with more or less intensity from a few hours to two or three days, the average duration being twenty-four hours.

Diagnosis. The symptoms are so characteristic that an error seems impossible. It may, however, be confounded with anæmic headache, hyperæmic headache, dyspeptic or bilious headache, and neuralgic or rheumatic headache. The pains of organic brain disease must be excluded.

Prognosis. While few cases of true migraine are permanently cured, the affection is free from danger to life. In a fair number of cases the susceptibility to attacks declines as the person advances in years, it being rarely seen after fifty years.

"Cases of migraine of the ophthalmic variety appear to be not rarely followed by general paralysis of the insane" (Herter).

Treatment. To abort an attack of migraine or dispel a paroxysm after its onset, rest in bed in a quiet, darkened room, with abstinence from food, and any one or two of four remedies are almost infallible —one is a hypodermic injection of *morphinæ sulphas*, gr. ¼ (0.016 Gm.), with *atropinæ sulphas*, gr. $\frac{1}{120}$ (0.00054 Gm.), or *antipyrine*, gr. xx (1.3 Gm.), repeated in an hour or two; or *phenacetin*, gr. x (0.6 Gm.), repeated in an hour or two. An excellent combination for the relief of the paroxysm is:

℞. Phenacetin, ... gr. xx 1.3 Gm.
Caffeina citrata, ... gr. v .3 Gm.
Camphoræ monobrom., ... gr. xx 1.3 Gm. M.
Ft. capsule No. x.
Sig.—One every two hours until relief.

In many attacks *extractum cannabis indicæ fluidum*, ♏ij–iij (0.12–0.2 Cc.), every half hour or hour for a number of doses, alone or combined with *extractum gelsemii fluidum*, in the same dose, is curative.

A combination for attacks associated with contraction of the vessels is—

℞. Potassii bromid., ... gr. xxx 2. Gm.
Morphinæ sulph., ... gr. ¼ .016 Gm.
vel
Codeinæ sulph., ... gr. j .065 Gm.
vel
Tr. opii deodorat., ... ♏xxx 2. Cc.
Aquæ menth. pip., ... ad f℥ss ad 15. Cc. M.
Sig.—Repeated p. r. n.

The local use of *menthol* pencils eases the pain, and the inhalation of spiritus camphoræ is agreeable.

In the intervals between the paroxysms employ measures to improve the general system, and to overcome as far as possible any of the etiological factors. For this purpose *extractum cannabis indicæ*, gr. ¼ (0.016 Gm.), three times daily for several months, is highly recommended.

"If the disposition to the malady is inherited, the prophylaxis is very important, and should include diet, exercise, clothing, and the avoidance of all those conditions which tend to develop an abnormal excitability of the nervous system. The best results have been obtained from galvanization of the superior ganglia of the sympathetic; the positive pole over the ganglion and the negative on the epigastrium in the tetanic (contraction of vessels) form, and the poles reversed in the paralytic (dilatation of vessels) form" (Bartholow).

ALCOHOLISM.

Varieties. Acute alcoholism; chronic alcoholism.

Synonyms. *Acute variety*, temulentia; mania-a-potu.

Chronic variety, delirium tremens; dipsomania, or oinomania.

It would hardly be correct to consider these terms interchangeable; they are rather names applied to various conditions due to acute or chronic alcoholic poisoning.

Definition. Alcoholism is the term used to designate the physical and mental phenomena induced by the abuse of alcohol. Alcohol is a poison, but becomes a much more dangerous one when associated with the various toxic products which are added to flavor it.

Temulentia, meaning drunkenness, or alcoholic intoxication; *mania-a-potu* is an acute mental derangement, occurring in those of strong neurotic tendencies; *delirium tremens* is an attack of delirium

associated with tremors in persons with the numerous changes resulting from chronic alcoholism. Delirium tremens frequently results in alcoholics having one of the forms of nephritis, preventing the elimination of some poison developed from the ingested alcohol. *Dipsomania, or oinomania*, an alcoholic insanity in which an individual at longer or shorter intervals has paroxysms of alcoholic desires, between which he neither wishes nor craves alcohol.

Causes. Predisposing causes are influences arising from unfavorable moral, social, and personal conditions. Heredity.

Exciting causes are the immoderate use of alcoholic beverages, of which there are three groups: 1, spirits, or distilled liquors; 2, wines, or fermented liquors, and 3, malt liquors.

Pathological Anatomy. *Acute Alcoholism.* The brain is the seat of an active hyperæmia; the mucous membrane of the stomach and duodenum is markedly injected and covered with a ropy mucus slightly tinged with blood, and the gastric juice is altered in quality and quantity. The kidneys are also the seat of an active hyperæmia.

Chronic Alcoholism. In this condition there are no organs or tissues which do not present morbid changes. The gastro-intestinal mucous membrane presents the changes of chronic catarrhal inflammation; the liver, the first organ to receive the poison after the stomach, presents the changes of congestion, cirrhosis, or fatty degeneration; the kidneys show chronic congestion and often the changes incident to chronic interstitial nephritis. The post-mortem results found in twenty-five cases of delirium tremens dying in the Philadelphia Hospital showed fourteen with the changes of interstitial nephritis, eight with chronic parenchymatous nephritis, and three with fatty kidney; all showed chronic gastric catarrh and changes in the myocardium and the arteries of the heart, brain, and the aorta. The muscular structure of the heart may undergo fatty degeneration and the vessels the senile changes of the aged. The brain structure presents the changes of sclerosis in various stages, and there may be chronic meningitis and pachymeningitis with hæmatoma. The nerves are altered, atrophied, and hardened, and the neuroglia, vessels, and ganglion cells of the spinal cord show similar changes.

Symptoms. *Acute alcoholism*, resulting from the use of a large quantity of alcoholic fluid, occurs with symptoms of mild intoxication to drunkenness passing to acute delirium and acute coma. The condition begins with a period of *exhilaration*, passing to *semi-*

delirium and ending in an *acute coma*, when the *breathing is stertorous*, the *face bloated and congested*, the *lips swollen* and *purplish*, the *pupils contracted* or dilated, the *pulse feeble and slow*, the *skin cold* and *clammy*, the *temperature depressed*, and frequently *control of sphincters lost*. An individual so affected is said to be "*dead drunk*."

Cases of ordinary drunkenness do not often pass beyond the stage of exhilaration, ending in a mild coma or sleep.

Mania-a-potu, or acute alcoholic delirium, is the direct result of alcoholic excess in those engaged in a sudden debauch, or who have drunk alcoholic beverages very "hard" for a comparatively short period. The individuals grow more and more excitable, lose all desire for food, are unable to sleep, become the prey of horrible hallucinations,—"the horrors,"—finally terminating in mania which resembles delirium tremens in all save the tremor, which is absent.

Delirium Tremens. In the majority of instances delirium results from a prolonged debauch, in an old drinker, with abstinence from proper food. It begins by an increased tremor, insomnia, irritable, excited manner, followed by the characteristic hallucinations and illusions, during which snakes and other forms of repulsive reptiles are seen, causing the most intense horror and abject fear; it is a busy delirium, the patient unable to remain quiet. There also occur illusions of smell and hearing. This marked excitement is followed by great depression, the skin is cold and clammy, the pulse feeble, the muscular system weak, the mind in a condition of coma-vigil, and if continued, a febrile condition, typhoid in character, with stupor or coma, develops. *Uræmic* symptoms frequently complicate the condition, the temperature suddenly bounding to 103° F., to 104° F., or 105° F., with albumin and casts in the scanty urine.

The ordinary duration of an attack of delirium tremens is about two weeks in those who recover, although death may occur at any time from cardiac failure, uræmia, or alcoholic pneumonia. Indeed, patients sometimes die suddenly in whom improvement had begun. Convalescence dates from the beginning of refreshing sleep, the patient awakening with a clear mind and desire for food. Should the delirium subside, but the patient continue to mutter and pick at the bed-clothing, the tongue become dry and cracked, and the regurgitation of dark brownish and bilious matter occur, the condition is critical and an early fatal termination may be expected.

Dipsomania, or oinomania, is the inherited or acquired mental condition which craves the drinking of intoxicating liquors. This is a true mental disease. It manifests itself in periodical attacks of excessive indulgence in alcoholic drinking, or this symptom of the sad disease may be replaced by other irresistible desires of an impulsive kind, such as lead to the commission and repetition of various crimes, the gratification of other depraved appetites, robbery, or even homicide. Imbecility and dementia frequently result.

The paroxysms at first occur at long intervals, but gradually the intervals become shorter and shorter until the individual entirely surrenders himself to alcoholic and other excesses.

Chronic Alcoholism. The condition to which this term has been given is truly a disease. It is the result of the continued use of alcoholic beverages until one or more of the morbid organic changes have occurred. These persons are markedly dyspeptic, with coated tongue, fetid breath, and early morning vomiting, straining, or retching, attended with much distress. There is a gradually developing muscular tremor, progressing to the ataxic gait. Insomnia or restless sleep is frequent. The face may either become pallid, flabby, and bloated, with an imbecilic expression, or swollen, rough, and dusky, with great bladders under the eyes, with yellow injected conjunctivæ. There is headache, vertigo, and attacks of hallucinations; the memory grows weaker, the judgment less accurate, the moral sense blunted, and the will power weak and erratic. These and many other symptoms add to the distress of the individual, which he attempts to overcome by the use of more and more of the poison.

Diagnosis. Profound drunkenness, or alcoholic coma, may and often is confounded with apoplectic and uræmic coma. Von Wedekind suggests the following method for diagnosing drunkenness: "By simply pressing on the supraorbital notches with a steadily increasing force you may, with certainty of success, bring an unconscious alcoholic to his senses, and thus differentiate between alcoholic and other comas."

The symptoms of chronic alcoholism often bear a close resemblance to the following maladies: General paralysis, disseminated sclerosis, paralysis agitans, locomotor ataxia, cerebral and spinal softening, epilepsy, dementia chronica, and nervous dyspepsia.

In individuals whose habits are secret the question of diagnosis is attended with considerable difficulty. Anstie lays much stress upon

the importance of the following four points, diagnostic of chronic alcoholism: *insomnia, morning vomiting, muscular tremor, and causeless mental restlessness.*

Prognosis. In acute alcoholism the prognosis is good if the patient is manageable.

In chronic alcoholism the organic changes, the direct result of the alcoholic habit, tend to shorten life by the production of fatty heart, Bright's disease, insanity, impotence, epilepsy, melancholia, and organic brain diseases. The danger in delirium tremens is heart failure or deepening coma. The association of chronic nephritis with delirium tremens, perhaps its cause, must always be taken into account in determining a prognosis. Acute lobar pneumonia is a very fatal complication in all forms of alcoholism.

Treatment. In deciding upon a plan of medication for any of the varieties of alcoholism, the condition of the kidneys, heart, and vessels must be considered. The treatment of a case of ordinary drunkenness requires little consideration, as the rapid elimination of the alcohol soon occurs if its ingestion be stopped. *Liquor ammonii acetatis* in large, frequently repeated doses, assists the elimination of the poison.

For *mania-a-potu* the immediate and complete withholding of alcoholic beverages is essential for its successful treatment. If the stomach will tolerate food,—and usually it will,—milk diluted with liquor calcis, or Seltzer water, or hot beef tea strongly seasoned with capsicum, should be administered every hour or two in small amounts.

The appetite is stimulated by the use of a combination like—

℞. Tinct. nucis vomicæ, ... f℥iv 15. Cc.
Tinct. capsici, ... f℥iv 15. Cc.
Tinct. cinchonæ comp., ... f℥ij 60. Cc. M.
Sig.—One teaspoonful, diluted, every two or three hours.

This stomachic stimulant may be alternated with *spiritus ammoniæ aromaticus*, f℥j (4 Cc.), given in hot milk, with advantage to the heart and nervous irritability. The bowels should be moved at once by the administration of an enema:

℞. Magnesii sulph., ... ℥ij 60. Gm.
Glycerini, ... f℥j 30. Cc.
Aquæ bul., ... f℥iv 120. Cc.

and the kidneys stimulated by full doses of *spiritus ætheris nitrosi* if the patient will swallow, and, if not, by the hypodermic use of *caffeinæ citrata*. The restlessness, insomnia, delirium, and visual and auditory hallucinations are usually controlled with *chloral*, and, on account of the gastric torpor and catarrh interfering with the prompt absorption of medicaments, is best given by the bowel:

℞. Chloral, ... gr. xx–xxx 1.3–2 Gm.
Infus. digitalis, ... f℥j 30. Cc.
Repeated in two hours, in milk.

If enema cannot be used, chloral or *trional*, gr. xxx (2 Gm.), may be given by mouth, or resort may be had to hypodermic medication if there is urgency, using *morphinæ sulphas*, gr. ¼–⅓ (0.016–0.022 Gm.), combined with *atropinæ sulphas*, gr. $\frac{1}{100}$ (0.00065 Gm.), or *hyoscinæ hydrobromas*, gr. $\frac{1}{100}$ (0.00065 Gm.). If the attack be associated with symptoms of cardiac depression, use brisk friction, hot alcohol and water sponging, artificial warmth, stimulating enemata, and the hypodermic administration of *strychninæ sulphas*, gr. $\frac{1}{20}$–$\frac{1}{30}$ (0.003–0.002 Gm.), repeated, or *caffeina citrata*, gr. iij (0.2 Gm.), or *digitalis*

"If chloral be inadmissible by reason of weakness of the circulation, *paraldehydum* may be substituted, in doses of from f℥ss–j (2–4 Cc.), repeated at intervals of from one to two hours until quietude is produced" (J. C. Wilson).

If one or two medicinal doses of the selected sedative drug does not produce quiet and sleep, be most cautious in repeating, remembering that the patient is suffering from the depressing effects of a cardiac and nervous poison, which is best combated by eliminating action on skin, bowels, and kidneys, and the administration of food.

An attack of acute alcoholism, or mania-a-potu, may often be aborted with *trional*, gr. xxx (2 Gm.), repeated in two hours, or *chloralamid*, gr. xxx–xl (2–2.6 Gm.), repeated. Excellent and prompt results follow the use of a hot-air bath until profuse sweating.

For the *collapse* following a lethal dose of alcohol, the stomach should be immediately emptied by emetics or the stomach tube or pump and the organ washed out with warm water or coffee, the patient placed in the recumbent position, and surrounded with artificial warmth, hot frictions to the lower extremities, the use of artificial respiration or the use of faradism to the thorax, inhalations of *ammonia*, hypodermic injections of *strychninæ sulphas*, *spiritus*

glonoini, *digitalis*, *strophanthus*, or *atropinæ sulphas*. "The flagging heart may be stimulated by occasionally tapping the præcordia with a hot spoon—Corrigan's hammer" (J. C. Wilson).

Delirium Tremens.—The patient should be isolated, have a skillful, sensible nurse, have the quantity of alcohol entirely withdrawn, or greatly reduced, have the stomach washed out daily, be supplied with easily digested nutritious diet, and action on the skin, kidneys, and bowels, with remedies to combat the excited nervous system. For this latter purpose no one combination is comparable with hypodermic injections of *morphinæ sulphas*, gr. ¼ (0.016 Gm.), with *atropinæ sulphas*, gr. $\frac{1}{100}$ (0.00065 Gm.), or *hyoscinæ hydrobromas*, gr. $\frac{1}{100}$ (0.00065 Gm.), repeated, or the use of *chloral* or *trional* by the bowel or by the stomach if the patient can or will swallow, or the stomach is not too irritable:

℞.	Chloral, ...	ʒiv	15. Gm.
	Tr. capsici, ...	fʒij	8. Cc.
	Aquæ menth. pip., .	q. s. ad fʒvj	ad 180. Cc.

Sig.—Tablespoonful every two hours until sleep, alternated with a cup of hot beef-tea, to which has been added a bolus of *capsicum*, gr. xx (1.3 Gm.).

Care is necessary that a condition of *coma* be not produced by the remedies mentioned, never giving more than two doses within six hours, but pushing hot liquid diet and *atropinæ sulphas*, gr. $\frac{1}{64}$ (0.001 Gm.), with *strychninæ nitras*, gr. $\frac{1}{32}$ (0.002 Gm.), by the hypodermic method, as experience has proven that these drugs given three times daily in reducing doses are the physiological antidote to the alcoholic toxin.

For depression and cardiac weakness, the internal use of any one of the following drugs is serviceable: *Strychninæ sulphas*, *caffeinæ citrata*, *spiritus chloroformi*, *ammonii carbonas*, *tinctura strophanthus*, or *digitalis*.

For the stomach atony use the nux and capsicum mixture mentioned above and washing out the stomach every day or two.

Other nervous sedatives recommended are *paraldehydum*, *chloralamid*, and the *bromides*.

Strict attention must be given to the skin, bowels, and kidneys. If the heart is not depressed, the cautious use of the *hot-air bath* or hypodermic injections of *pilocarpinæ hydrochloras*, gr. ⅓ (0.02 Gm.), repeated at the onset of the mania.

Chronic Alcoholism.—The combine of symptoms termed chronic alcoholism are the direct result of the continuous action of a toxic principle, and no success of even a temporary kind can be expected unless the poison be withdrawn. The rapidity with which this can be accomplished is a question for the skill, judgment, and experience of the physician to determine; the chief obstacle to its success will be found moral rather than physical. Next to the disuse of alcohol is the question of diet. Progress will be made as the appetite and digestion improve, and great attention should be given to these. The general health will also be benefited by fresh air, exercise, mental occupation, and cold or tepid sponging and an occasional hot bath at bedtime. For the combination of symptoms of spirit-craving, morning vomiting, muscular tremor, mental restlessness, and insomnia, no drug is comparable with *strychninæ nitras*, either hypodermically twice daily, or, what is preferable, by the stomach to secure its local action on the mucous membrane. If the insomnia be persistent in spite of the foregoing treatment, the temporary use may be made of such remedies as *chloral, morphinæ sulphas, paraldehydum*, or *trional.* In many cases it is desirable, for its mental effect, if no other, administer what the patient terms a substitute for his alcoholic beverages. The following is a good combination for that purpose:

℞.	Tincturæ nucis vomicæ, . . . f℥ss	15. Cc.	
	Tincturæ capsici, ... f℥ss	15. Cc.	
	Ext. lupulini fld., ... f℥iij	90. Cc.	
	Inf gent. co., ... f℥ij	60. Cc.	M.

Sig.—Dessertspoonful three or four times daily, well diluted.

For the anæmia, loss of strength, and mental debility, benefit may follow the use of *syrupus hypophosphitis cum strychninæ.*

Dipsomania.—The management of these cases is much the same as has already been mentioned for chronic alcoholism, although the *strychninæ sulphas* treatment should be given the preference.

HEAT STROKE.

Synonyms. Insolation; sunstroke; thermic fever; coup-de-soleil; heat exhaustion.

Definition. A depression of the vital powers, the result of

exposure to excessive heat. The condition manifests itself as acute meningitis (rare), heat exhaustion (common), and as true sunstroke.

Causes. Exposure to the influence of excessive heat, either to the direct rays of the sun or artificial heat in confined quarters, or diffused atmospheric heat without proper ventilation.

Among the predisposing causes which act by lessening the power of the system to resist the heat, are great bodily fatigue, overcrowding, and intemperance.

Pathological Anatomy. The action of the heat upon the system is so sudden, and the malady so rapid in its course, that structural changes have not developed. The left ventricle is firmly contracted (Wood). The right heart and vessels are gorged with dark fluid blood. All the tissues and organs of the body are in a state of great venous congestion. The blood is dark, thin, and either but feebly alkaline or decidedly acid, and its power of coagulability is destroyed. The *post-mortem* rigidity is early and marked.

Symptoms. Depending upon the variety.

Acute meningitis, the result of exposure to heat, has symptoms similar to those due to other causes.

Heat exhaustion develops with a rapid feeling of *weakness* and *prostration*, the *surface cool*, the *face pale*, the *voice weak*, the *pulse rapid* and *feeble*, the *respiration increased*, the *vision* growing *dim* and *indistinct*, *noises* develop in the *ears*, the individual, overcome, becoming *partially* or *completely unconscious*. In some cases the attack of prostration is sudden, the person falling unconscious, with perhaps *convulsions* or *tremors*, and shrunken features.

Sunstroke. The symptoms developing suddenly, with or without prodromata, are *insensibility*, with or without *delirium* or *convulsions* or *paralysis*, the *surface flushed* and *hot*, the *conjunctivæ injected*, and *breathing* either rapid and shallow or labored and stertorous, the *pulse quick* and either bounding or weak, and the *temperature* in the axilla ranging from 105° to 108°, to 110°, with suppression of all glandular action. Death occurring, the result of asphyxia, or from a slow failure of respiration and cardiac action.

Diagnosis. It is of great importance, therapeutically, to distinguish at once between attacks of sunstroke and heat exhaustion. Cases of sunstroke are to be differentiated from cerebral hemorrhage

and alcoholic insensibility, for which purpose the clinical thermometer is indispensable.

Prognosis. Attacks of heat exhaustion, if properly and promptly treated, favorable. The prognosis of sunstroke, or heat-fever, is unfavorable in the majority of cases, death resulting in from half an hour to several hours. Unfavorable indications are, increased temperature, cardiac failure, convulsions, absent reflexes, followed by complete muscular relaxation.

Favorable indications are, decline in surface heat and axillary or rectal temperature, stronger pulse, increased depth of respirations, restored reflexes, and return of consciousness.

Sequelæ. If recovery follow either variety, any one of the following conditions may result: headache, vertigo, insomnia, epilepsy, mental enfeeblement, and monoplegia, paraplegia, or hemiplegia.

Treatment. Cases of *heat exhaustion* are successfully treated by placing the patient in the recumbent position, with the head low and the use of stimulants. If able to swallow, administer at once *spiritus vini gallici*, ℥ss–j (15–30 Cc.), with *tinctura opii deodorata*, ♏xv–xxx (1–2 Cc.), to be repeated p. r. n.; and *spiritus ammoniæ aromaticus*, f℥j (4 Cc.), in hot water or milk every half hour. If he be unable to swallow, the remedies may be thrown into the rectum, or *spiritus frumenti*, *strychninæ sulphas*, and *tinctura digitalis* can be used hypodermically. As convalescence occurs, tonic doses of *quininæ hydrochloras* and *strychninæ sulphas* should be prescribed.

For *sunstroke*, the indications for treatment are the very opposite. The patient is in imminent danger from the extraordinary temperature, and measures to reduce it must at once be instituted. Of these none give such excellent results as rubbing with *ice*, or the *cold bath* or *cold pack*, and *cold affusions*, *cold enemata*, and the hypodermic use of *quininæ sulphas*, or *antipyrin*. The tendency to subsequent rise of temperature is met by wrapping the patient in a wet sheet, or the repetition of the hypodermics mentioned if consciousness has not been regained, when they can be given by the mouth. If convulsions and restlessness occur, the hypodermic use of *morphinæ sulphas*, gr. ¼–½ (0.016–0.032 Gm.), cautiously repeated, is successful, or *chloral* and the bromides by the rectum. If symptoms of depression occur, the stomachic, rectal, or hypodermic administration of stimulants is indicated, and *strychninæ sulphas*, gr. $\frac{1}{24}$ (0.0025 Gm.) repeated half hourly by the hypodermic method.

For convalescence, use *quininæ hydrochloras*, *strychninæ sulphas*, or *ferrum*.

ACUTE HYDROCEPHALUS.

Synonyms. Acquired hydrocephalus; serous apoplexy.

Definition. Strictly speaking, *hydrocephalus* signifies water in the brain; but it is here restricted to the presence of a serous fluid in the arachnoid spaces, in the pia mater, in the ventricles, and in the brain substance (œdema); characterized by the more or less sudden development of cerebral excitation, followed by depression and usually death.

Causes. Most common between the ages of one and five, although it may occur at any age. "The predominance of the nervous system in the bodily conformation" is a strong predisposing cause. Among the exciting causes are unfavorable hygienic conditions, dentition, eruptive fevers, blows on the head, mechanical causes preventing the return of the blood from the venæ Galeni and the right sinus, compression of the jugular vein, diseases of the right heart, and Bright's disease.

Pathological Anatomy. The effusion may be limited to the ventricles, although there is usually considerable distention of the subarachnoid spaces and œdema of the pia mater and neighboring portions of the brain, whence results more or less softening, especially around the ventricles. The choroid plexus is hyperæmic, and may be the seat of minute extravasations.

Symptoms. There are three varieties of acute hydrocephalus with characteristic symptoms, to wit: *comatose*, *convulsive*, and the *ordinary*.

Comatose variety, known also as "serous apoplexy," begins abruptly with the phenomena of apoplexy, the result of the sudden effusion. The pressure is usually so great on the medulla oblongata that it ceases to functionate, death resulting in a few hours, rarely lasting several days.

Convulsive variety, the result of Bright's disease or a general dropsy, is ushered in with headache, nausea, and vomiting, followed in a day or two with *convulsions*, passing into coma, which usually terminates fatally, although rarely a remission may precede death for a day or two.

Ordinary variety, the most common in children, begins with feverishness, headache, vertigo, photophobia, restlessness, nocturnal delirium, insomnia, twitching, and spasmodic contractions of the muscles and great hyperæsthesia of the skin. Such symptoms continue for several days, when convulsions occur, followed by death, or a continuance of the symptoms, followed by rigidity, stupor, and death.

Prognosis. Unfavorable.

Treatment. An attempt may be made to remove the fluid by *diuretics* and full doses of *potassii iodidum*.

CONGENITAL HYDROCEPHALUS.

Synonym. Chronic hydrocephalus (?).

Definition. An excessive accumulation of the cerebro-spinal fluid—a cerebral dropsy—in the ventricles—*internal hydrocephalus*, or in the meshes of the pia arachnoid—*external hydrocephalus*, or in both—*mixed hydrocephalus;* characterized by enlargement of the head and more or less pronounced nervous phenomena.

A disease of infants or very young children.

Causes. Imperfect or arrested development of the brain or its membranes. Occurs in the offspring of tubercular, scrofulous, or syphilitic parents. Inflammatory changes in the ventricles and ependyma.

Pathological Anatomy. Enlargement of the head is the chief external pathological condition, although there is no constant ratio between the size of the head and the amount of fluid, the quantity varying from an ounce to a pint or more. The liquid is transparent, of a straw color, containing a small amount of albumin and chloride of sodium.

If the quantity of fluid be small, the ventricles are simply distended; if the amount be large, the optic thalami and corpus striatum are depressed and flattened, the roof of the ventricles thinned, and the foramen of Monro is greatly enlarged. The enlargement of the head may occur before birth and impede or prevent natural delivery, or the head may be normal at birth and increase afterward. As enlargement progresses, the bones are so thinned as to be translucent, the fontanelles and sutures are widened, the lateral portions of the cranium project, the forehead bulges out over the eyes, and the orbital plates

are depressed, forcing the eyes outward and downward, producing a variety of exophthalmos; the head has an irregular, triangular shape, the base of the triangle being the top of the head. The scalp being stretched by the pressure within, becomes tense and thin, and but scantily covered with hair; the veins which ramify in it are unusually prominent and large, and the entire head is elastic on pressure, from the amount of liquid beneath.

Hilton, in *Rest and Pain*, says: "In almost every case of internal hydrocephalus which I have examined after death I found that this cerebro-spinal opening (between the fourth ventricle and the spinal canal) was so completely closed that no cerebro-spinal fluid could escape from the interior of the brain; and, as the fluid was being constantly secreted, it necessarily accumulated there, and the occlusion formed, to my mind, the essential pathological element of internal hydrocephalus."

Symptoms. The increased size of the head, with the emaciated condition of the child, who seemingly eats well, is what first attracts the attention. The head appears too heavy; the eyes are prominent and have a downward direction; the face is devoid of expression, old and wrinkled, the voice feeble; the mental development is not in keeping with the age. When the period for standing or walking arrives, the power is found wanting. The further history is but a continuation and exaggeration of this, until *convulsions* occur, which sooner or later terminate fatally.

The *course* of congenital hydrocephalus is usually slow, but progressively worse. The majority terminate within the first year; cases are recorded, however, of ten and fifteen years' duration.

Diagnosis. In rachitis the volume of the head is increased, due, in part, at least, to a deposit of calcareous matter on the exterior of the cranial bones. Rachitis may be mistaken for hydrocephalus in cases in which the amount of liquid is small. The differential diagnosis is based on the shape of the head—round in rachitis, square or triangular or with prominences in hydrocephalus, with the persistent downward direction of the eyes and the elasticity of the head on pressure.

Prognosis. Unfavorable. Arrest of progress and even cures have been reported. Spontaneous cures have been reported following the accidental discharge of the fluid. But such reports are exceptional.

Treatment. The use of the finest aspirator needle to evacuate the fluid is fully justifiable. The proper situation for the puncture is the coronal suture, about an inch or an inch and a half from the anterior fontanelle. Firm but gentle compression of the cranium with adhesive strips should be made during the escape of the fluid and afterward. A few ounces of fluid only should be withdrawn at a time. The internal use of *potassii iodidum* is recommended.

All measures which tend to promote the constructive metamorphosis are to be employed.

DISEASES OF THE SPINAL CORD.

SPINAL HYPERÆMIA.

Synonyms. Spinal congestion; plethora spinalis.

Definition. An abnormal fullness of the vessels of the meninges and cord: *active* when an arterial hyperæmia; *passive* when a venous hyperæmia; characterized by pain in the back, with more or less pronounced disorders of sensation and locomotion.

Causes. Cold and exposure; arrested menses; arrest of a habitual hæmorrhoidal discharge; malaria; protracted erect posture; injuries to the back; certain spinal poisons, as strychnina, picrotoxinum, and alcoholic excesses.

Pathological Anatomy. *Active.* The post-mortem appearances are congestion of the meninges and cord, the same vessels supplying both, with numerous points of extravasation, due to the rupture of capillary vessels. The spinal fluid is increased in amount.

Passive. A general bluish discoloration, owing to the abnormal fullness of the large anastomosing vessels; the spinal fluid somewhat increased.

Symptoms. *Active.* Dull *pain* in the dorsal or lumbar region, shooting into the hips and thighs, persistent and increased by pressure; tenderness on motion; *tingling sensations* in the limbs and feet, and sometimes in the hands and arms; a feeling of constriction about the abdomen is often present, with rigidity of the abdominal

muscles. *Increased reflexes*, with *disorders of motility*, and when the patient is in the recumbent position, *jerking of the limbs*. On attempting to walk, it is accomplished with difficulty. from an *incomplete loss of power*.

If the upper part of the cord be affected, *dyspnœa* and *palpitation* occur.

There often occur painful priapism and frequent nocturnal emissions.

The above symptoms may be followed by a more or less pronounced temporary depression, the sensation diminished, and the lower limbs benumbed and heavy, the movements weak.

The electro-contractility is preserved, and in many cases even increased or exaggerated.

Duration. From a few hours to several days; if longer, myelitis may result.

Diagnosis. *Anæmia* causes more or less spinal irritability and tenderness; but the history, pallor, and general weakness, unassociated with defects of motility or sensibility, will prevent error.

Spinal meningeal hemorrhage is more sudden in its onset, its violence, and its range of symptoms.

Myelitis and spinal meningitis have symptoms in common with spinal congestion, which will be pointed out when discussing those conditions.

Prognosis. Favorable, recovery occurring in three or four days.

If the symptoms show a tendency to linger, myelitis, more or less pronounced, will ensue.

Treatment. Rest, but avoid lying on the back; cups or leeches along the spine, followed either by the iced or the hot douche, or hot sponges, with active purgation, to diminish the blood pressure.

If the result of suddenly arrested perspiration, *pilocarpus* and a *hot-air bath*. If following suddenly arrested menses, *aconitum*. If associated with an active circulation, *potassii bromidum*, or *extractum gelsemii fluidum*, ♏v (0.3 Cc.), every four hours, or *extractum ergotæ fluidum*, f℥ss–j (2–4 Cc.), repeated p. r. n.; *and* in all cases active purgation.

For the passive form, treating the cause, *ergota*, *digitalis*, tonics, and purgatives.

PACHYMENINGITIS SPINALIS.

Synonyms. Pachymeningitis spinalis interna; hypertrophic pachymeningitis; pseudo-membranous pachymeningitis.

Definition. An inflammation of the inner surface of the spinal dura mater; characterized by violent pains in the head, neck, shoulders, and arms, followed by contractures and paralyses of the upper extremities.

Causes. Exposure to cold and damp; alcoholism; syphilis; gout; injuries.

Pathological Anatomy. *Hypertrophic pachymeningitis* is characterized by an exudation upon the inner surface of the dura mater, which gradually solidifies into a layer of compact connective tissue, this presses upon the spinal cord and nerves, producing a myelitis and atrophic neuritis, resulting in muscular atrophy.

The most frequent seat of this form of the affection is the cervical region, as first demonstrated by Charcot, whence the term *cervical hypertrophic pachymeningitis.*

In the *pseudo-membranous* form a membranous exudation also occurs, in which large numbers of blood-vessels develop and rupture, the hemorrhagic extravasation forming a cyst—hæmatoma—which causes pressure on the cord and nerves.

Symptoms. The onset is slow and gradual, with irregular *chills* and *feverishness*, *violent pains*, *and stiffness* in the head, neck, shoulders, and arms, continuous, but subject to exacerbations, and associated with a *painful constriction* of the upper thorax. Numbness and prickling occur in the arms, more marked in one than the other. Rarely nausea and vomiting occur. These symptoms may continue off and on for several months, the *muscles* of the painful parts *atrophying*, followed by spasmodic contraction, particularly of the hands and wrists, followed later by paralysis.

The *paralytic stage* develops gradually, with weakness in the arms, associated with contractures and rigidity. The pain continues with anæsthesia, hyperæsthesia, and trophic changes. Later, paraplegia with rigidity, exaggerated reflexes, and spinal epilepsy develop.

The development of tuberculosis and nephritis during the progress of chronic cerebral and spinal diseases, which are the immediate cause of death, is a clinical observation.

The electro-contractility is lost.

Prognosis. If early recognized and promptly treated, the hypertrophic form may be improved. Generally, however, the prognosis is unfavorable.

Treatment. Rest; nutritious diet; *oleum morrhuæ*, and the *hypophosphites;* large doses of *potassii iodidum*, and repeated but systematic counter-irritation.

Symptomatic remedies for the pain and spasms are indicated.

SPINAL MENINGITIS.

Synonym. Leptomeningitis spinalis.

Definition. Inflammation of the arachnoid and pia mater membranes of the spinal cord, either acute, subacute, or chronic; characterized by pain in the back, rigidity of the muscles, disorders of motility and sensibility. It may be acute or chronic.

Causes. The disease is rare and is always due to an infection from tubercle, syphilis, typhoid fever, or septicæmia, or the result of a traumatism.

Pathological Anatomy. *Acute.* Hyperæmia of the membranes, with swelling of the tissues, the result of serous infiltration, followed by purulent and fibrinous exudations. The roots of the spinal nerves are covered with exudation, and are swollen and soft. The cord proper is more or less congested and œdematous.

Chronic. Adhesion of the membranes, with more or less accumulation of fluid, resulting in atrophic degeneration of the cord from pressure.

If the disease is secondary to tubercle, these granulations are seen distributed over the pia, arachnoid, and inner surface of the dura.

Symptoms. There are two stages: the first, the stage of *irritation;* the second, the stage of *paralysis* of motion and sensation, with atrophy. Although an inflammatory affection, yet its onset is usually subacute, the febrile reaction being moderate, with intense boring *pain* in the back, aggravated by motion, *rigidity of the spine*, and a sense of *constriction around the body*,—"the girdle." *Spasmodic contractions* of the muscles enervated by the nerves originating at the seat of the lesion, with inability to straighten the limbs. If the lower part of the spinal membranes is the seat, there occur *retention* of

urine and *constipation;* if upper part, *dysphagia*, *dyspnœa*, and *feeble heart.* The muscular contractions are excited or increased by motion, but uninfluenced by pressure. *Reflex movements* are not abolished. The rigidity and spasmodic contraction of the muscles are followed by *paralysis*, more or less complete, death following from paralysis of the muscles of respiration.

If the inflammation extend to the medulla, the above symptoms are associated with *disorders of speech*, *vomiting*, and *delirium.*

Electro-contractility lessened or absent, both as to motility and sensibility in the affected parts.

Chronic form succeeds to the acute or originates spontaneously, and presents the same form and order of symptoms—excitation or irritation, and depression or paralysis.

Diagnosis. The points of importance are: deep, boring pain in the back, aggravated by motion but not by pressure, with spasmodic contraction of the muscles, followed by paralysis.

Myelitis slight, or absence of pain, with earlier and more complete paralysis.

Tetanus may be confounded with spinal meningitis. The points of distinction are: in the former occur early trismus with rhythmical spasms excited by irritation of the skin, whereas irritation of the skin does not in spinal meningitis produce muscular contractions, but movement of the limbs does do so; progressively increasing, and not associated with fever; usually a clear history of an injury.

Prognosis. Generally unfavorable. Death is either sudden, from paralysis of respiration and of the heart, or gradually, the result of exhaustion.

Critical discharges, such as profuse perspiration, urinary flow, or epistaxis occur, and are followed by rapid recovery. Cases recovering may have more or less pronounced partial or complete paralysis.

Treatment. Rest in bed, upon the side or face. *Cups* or *leeches* along the spine, followed by *ice*, the *hot douche*, *hot sponges*, or mustard. Active purgation.

If the result of syphilis, full doses of *potassii iodidum*, gr. x–xl (0.6–2.6 Gm.), combined with *hydrargyri chloridum corrosivum*, gr. $\frac{1}{24}$–$\frac{1}{12}$ (0.0025–0.005 Gm.).

For the paralytic stage, *quininæ sulphas*, gr. iij (0.2 Gm.), with *extractum belladonnæ alcoholic*, gr. ¼ (0.016 Gm.), three times a day, is sometimes useful.

For paralysis, the *galvanic current* to the spine and nerve trunks, and the *faradic current* to the affected muscles, with the deep injection of *strychnina* and the use of *massage.*

ACUTE MYELITIS.

Synonyms. Acute or general diffuse myelitis; transverse myelitis; softening of the cord.

Definition. An inflammation affecting the substance of the spinal cord, which may be limited to the gray or white matter, and involve the whole or isolated portions of the cord. When the *gray* matter alone is inflamed, it is termed *central myelitis;* when the *white* matter and the *meninges*, it is termed *cortical myelitis;* it may be ascending, descending, or transverse in its extension. The disease is characterized by more or less sudden and complete loss of motion and sensation.

Causes. Following spinal meningitis; exposure to cold and damp or wet weather; *injuries* to the vertebræ; prolonged functional activity of the cord; typhus fever; rheumatism; *syphilis;* puerperal fever, or, during the course of the exanthemata, arsenical, lead, or mercurial poisoning.

Pathological Anatomy. Intense hyperæmia of the substance of the cord, with extravasations, giving the tissues a reddish-brown or chocolate tint, and also serous transudations, resulting in softening of the structure of the cord, the color changing to yellow and white, the nerve elements undergoing fatty degeneration, presenting the appearance and consistency of cream. The membranes also undergo more or less change.

Symptoms. The severity of the symptoms depend upon the extent and location of the inflammation.

The onset is usually sudden, with a *chill, fever*, 103° F., *frequent pulse*, with *alterations in sensibility and motility*—to wit: *pain* in the back, aggravated by touch and by heat and cold, with sensations of formication ("pins and needles"), the limb feeling as if asleep, or else complete *anæsthesia*, associated with severe *neuralgic pains.*

The distinction between *anæsthesia*, insensibility to touch, and *analgesia*, insensibility to pain, must be clearly determined.

A sensation of *constriction* around the body and limbs, as if encircled by a tight cord, "the girdle pains," is a characteristic symptom, fol-

lowed by rapidly developing *paraplegia*, complete in a few hours, with involuntary discharges. The *reflex functions* are usually abolished, as seen by attempting to cause movement of the limbs by tickling the feet or by striking the patella tendon; rarely are they diminished, very rarely exaggerated. The temperature of the affected limbs is lowered three or four degrees.

Sloughs and bed-sores and muscular atrophy result if the anterior cornua—the trophic centres—are affected.

The symptoms of *loss of motion and sensibility*, with *rectal and vesical paralysis*, are associated with more or less pronounced vomiting, hepatic disorders, irregularity of the heart, dyspnœa, dysphagia, apnœa, and painful priapisms. The urine is markedly alkaline in reaction, finally developing cystitis.

Among the late manifestations are *shooting pains* and *spasmodic twitchings* or *contractions* of one or all of the muscles of the paralyzed parts.

The electro-contractility is abolished in the paralyzed parts.

Diagnosis. *Acute spinal meningitis* is distinguished from acute myelitis by severe pains, increased by pressure, with muscular contractions increased by motion, followed by paralysis much less profound than the paraplegia of myelitis; in spinal meningitis there exists cutaneous and muscular hyperæsthesia, which are absent in myelitis.

Congestion of the spinal cord is characterized by the mild character and short duration of all the symptoms.

Hemorrhage in the spinal canal is abrupt with irritative symptoms, slight paralysis, preserved reflexes, and electro-contractility.

The principal diagnostic points of acute myelitis are the "girdle" around the limbs or body, rapid and complete paraplegia, *loss* of sensation, lowered temperature in the affected parts, early and persistent sloughing (bed-sores), and alkaline urine or cystitis.

Hysterical paraplegia shows no trophic changes, no altered reflexes, slight atrophy, irregular anæsthesia, contractures with impaired sensation of the contracted limb, and the presence of the stigmata of hysteria.

Lithæmic paræsthesia, tingling and numbness of fingers and toes, might lead to error if the cerebral symptoms of lithæmia are overlooked.

The *diagnosis* of the *location of the lesion* is made by a study of the height of the anæsthesia, the skin reflexes, and the distribution and extent of the paralysis, which are shown in the following table from Dana, based on that originally devised by Starr and modified by Mills and Dana.

LOCALIZATION OF THE FUNCTIONS OF THE SEGMENTS OF THE SPINAL CORD.

SEGMENT.	MUSCLES.	REFLEX AND CENTRES.	SENSATION.
First cervical.	Rectus laterales. Rectus capitis. Anticus and posticus. Sterno-hyoid. Sterno-thyroid.		
Second and third cervical.	Sterno-mastoid. Trapezius. Scaleni and neck. Omo-hyoid. Diaphragm.	*Hypochondrium* (?). Sudden inspiration produced by sudden pressure beneath the lower border of ribs.	Back of head to vertex and neck. (Occipitalis major, occipitalis minor, auricularis magnus, superficialis colli, and supraclavicular.)
Fourth cervical.	Diaphragm. Deltoid. Biceps. Coraco-brachialis. Supinator longus. Rhomboid. Supra- and infra-spinatus.	*Pupillary* (fourth cervical to second dorsal). Dilatation of the pupil produced by irritation of neck.	Neck. Shoulder, anterior surface. Outer arm. (Supraclavicular, circumflex, external musculo-cutaneous, cutaneous.)
Fifth cervical.	Deltoid. Biceps. Coraco-brachialis. Brachialis anticus. Supinator longus. Supinator brevis. Deep muscles of shoulder-blade. Rhomboid. Teres minor. Pectoralis (clavicular part). Serratus magnus.	*Scapular* (fifth cervical to first dorsal). Irritation of skin over the scapula produces contraction of scapular muscles. *Supinator longus.* Tapping the tendon of the supinator longus produces flexion of forearm.	Back of shoulder and arm. Outer side of arm and forearm to the wrist. (Supraclavicular, circumflex, external cutaneous, internal cutaneous, posterior spinal branches.)
Sixth cervical.	Deltoid. Biceps. Brachialis anticus. Subscapular. Pectoralis (clavicular part). Serratus magnus. Triceps. Pronators. Rhomboid. Latissimus dorsi.	*Triceps* (fifth to sixth cervical). Tapping elbow tendon produces extension of forearm. *Posterior wrist* (sixth to eighth cervical). Tapping tendons causes extension of hand.	Outer side and front of forearm. Back of hand, radial distribution. (Chiefly external cutaneous, internal cutaneous, radial.)
Seventh cervical.	Triceps (long head). Extensors of wrist and fingers. Pronators of wrist. Flexors of wrist. Subscapular. Pectoralis (costal part). Serratus magnus. Latissimus dorsi. Teres major.	*Anterior wrist* (seventh to eighth cervical). Tapping anterior tendons causes flexion of wrist. *Palmar* (seventh cervical to first dorsal). Stroking palm causes closure of fingers.	Radial distribution in the hand. Median distribution in the palm, thumb, index, and one-half middle finger. (External cutaneous, internal cutaneous, radial, median, posterior spinal branches.)
Eighth cervical.	Triceps (long head). Flexors of wrist and fingers. Intrinsic hand muscles.	. . . . .	Ulnar area of hand, back and palm, inner border of forearm. (Internal cutaneous, ulnar.)

LOCALIZATION OF THE FUNCTIONS OF THE SEGMENTS OF THE SPINAL CORD.—*Continued.*

SEGMENT.	MUSCLES.	REFLEX AND CENTRES.	SENSATION.
First dorsal.	Extensors of thumb. Intrinsic hand muscles. Thenar and hypothenar muscles.	. . . . .	Chiefly inner side of forearm and arm to near the axilla. (Chiefly internal cutaneous and nerve of Wrisberg or lesser internal cutaneous.)
Second dorsal.	. . . . .	. . . . .	Inner side of arm near and in axilla. (Intercosto-humeral.)
Second to twelfth dorsal.	Muscles of back and abdomen. Erectores spinæ.	*Epigastric* (fourth to seventh dorsal). Tickling mammary region causes retraction of the epigastrium. *Abdominal* (seventh to eleventh dorsal). Stroking side of abdomen causes retraction of belly. Vasomotor centres. Second dorsal to second lumbar.	Skin of chest and abdomen, in bands running around and downward, corresponding to spinal nerves. Upper gluteal region. (Intercostals and dorsal posterior nerves.)
First lumbar.	None.	*Cremasteric* (first to third lumbar). Stroking inner thigh causes retraction of scrotum.	Skin over groin and front of scrotum. (Ilio-hypogastric, ilio-inguinal.)
Second lumbar.	Vastus internus.	*Patellar.* Striking patellar tendon causes extension of leg.	Outer side and upper front of thigh. Lumbar region. (Genito-crural, external cutaneous.)
Third lumbar.	Sartorius; adductors of thigh. Flexors of thigh.	. . . . .	Front and outer side of thigh. Inner side of leg and foot.
Fourth lumbar.	Extensors of knee. Abductors of thigh.	*Gluteal* (fourth to fifth lumbar). Stroking buttock causes dimpling in fold of buttock.	Inner side of thigh, leg, and foot. (Internal cutaneous, long saphenous, obturator.)
Fifth lumbar.	Outward rotators. Flexors of knee. Flexors of ankle. Peronei. Extensors of toes.	*Achilles tendon.* Over-extension causes rapid flexion of ankle, called ankle clonus.	Back of thigh and outer side of leg and ankle; sole; dorsum of foot. (External popliteal, external saphenous, musculo-cutaneous, plantar.)
First and second sacral.	Calf muscles. Glutei. Peronei. Extensors of ankle. Small muscles of foot.	*Plantar* (fifth lumbar to second sacral). Tickling sole of foot causes flexion of toes and retraction of leg.	Back of buttock and thigh; side of leg and ankle; sole; dorsum of foot.
Third, fourth, and fifth sacral.	Perineal. Muscles of bladder, rectum, and external genitals.	Genital centre. Vesical centre. Anal centre.	Circumanal region, anus, rectum, penis, urethra, vagina, perineum. (Small sciatic, pudic, inferior hemorrhoidal, inferior pudendal.)

Prognosis. Depends upon the location of the lesion and completeness of the symptoms.

If the paralysis is of the *ascending variety*, death occurs within a few days, from paralysis of the muscles of respiration.

If the *trophic centres* are affected, there occur bed-sores, intense pyelo-nephritis and cystitis and changes in the joints; death from exhaustion in several weeks.

Central myelitis, or inflammation of the *gray matter*, is rapid in its progress, death occurring in a week or two.

The morbid process may be arrested and the general health restored, but some spinal symptoms will persist.

Treatment. Absolute rest is essential to even secure a palliation of the symptoms.

Locally, considerable relief follows the use of hot-water bags or sponges dipped in *hot* water and applied along the spine every few hours.

The remedies most strongly recommended are: *digitalis*, *strychninæ sulphas*, *ergota*, *belladonna*, *bromides*, *cimicifuga*, and *quininæ sulphas*, although I have never observed a cure with any plan of medication after the disease was fairly established. Cases due to syphilis are benefited by large doses of *potassii iodidum*. Gray reports having administered 700 grains daily before improvement began.

INFANTILE SPINAL PARALYSIS.

Synonyms. Myelitis of the anterior horns; poliomyelitis anterior acuta; essential paralysis of children; atrophic paralysis of children.

Definition. A rapidly developed inflammation of the anterior horns of the gray matter of the cord, occurring suddenly in children, at times in adults,—*acute spinal paralysis of adults*,—characterized by mild fever, muscular tremors and twitchings, and paralysis of groups of muscles, followed by more or less atrophy.

Causes. Essentially a disease of early life—the second month to the third or fourth year. The fact of its having occurred in adults must be borne in mind. Cold and damp; dentition (?); injuries to the spine; developed during convalescence from the acute exanthemata.

Pathological Anatomy. The early changes are: Medullary hyperæmia, vascular exudation and inflammatory softening, although the naked eye may not recognize any changes. Microscopical examination reveals inflammatory softening of the anterior horns of the gray matter. Among other constant lesions are atrophic degeneration of the multipolar ganglion cells and of the anterior nerve roots.

The changes noted as occurring in the cord are usually limited to the dorso-lumbar and cervical enlargements.

As a direct result of the changes in the *trophic centres* and the nerve degeneration of the muscular fibres supplied, there ensue changes in the bones and joints, leading to great deformities.

Symptoms. The onset of the affection varies; it may be acute, subacute, or chronic; it is usually sudden, with an attack of mild *fever* of a remittent type, of a few days' duration, on recovery from which it is noticed that the child is *paralyzed.* Rarely, the paralysis may be preceded by *convulsions.*

The *paralysis* may affect both arms and both legs, the legs alone, or only one of the four extremities; it may, but very rarely, be a hemiplegia. As a rule, however, the leg suffers more frequently than the arm: in paralysis of the leg the muscles below the knee suffer more severely than those above. The bladder and rectum are not affected, or if so, only temporarily, nor can anæsthesia or numbness be detected. The temperature of the paralyzed limb is low and the appearance cyanosed. After a few days there is a slight improvement in the paralyzed parts, although the muscles show a rapid wasting, which is progressive until all muscular tissue is gone.

The *reflex movements* are *impaired* or *abolished.*

The *electro-contractility* by the faradic current is *abolished* in the paralyzed parts.

With the *galvanic* or constant current the "reactions of degeneration" are developed. To fully understand the meaning of this term a knowledge of the normal electrical reactions is necessary.

The normal formula for the production of muscular contraction in the physiological state are as follows, the strength of the current being barely capable of causing fair contractions:

First. The most effective contractions are produced by the *cathode* (*negative*) *pole* on closing the circuit (C. C.).

Second. The second most effective are produced by the *anode* (*positive*) *pole* on closing the circuit (A. C.).

Third. The next most effective is by the *anode pole* on opening the circuit (A. O.).

Fourth. Cathode pole contractions on opening circuit are rarely seen in the physiological state (C. O.).

The "reactions of degeneration" are shown by any reversal of the regular formulæ—to wit: if the *anodal* closure (A. C.) shows stronger contractions than *cathodal* closure (C. C.); still greater degeneration is shown if *anodal opening* (A. O.) contractions are stronger than either of the above; and most complete degeneration is shown by the complete reversal of the normal formulæ as shown by distinct *cathodal* opening (C. O.) contractions.

Sequelæ. Amongst the deformities resulting from the paralysis are the different forms of talipes.

Talipes equinus, the result of paralysis of the antero-external muscular group of the leg.

Equino-varus, the result of paralysis of the antero-external muscular group of the leg, together with the adductors of the foot.

Talipes calcaneus, the result of paralysis of the muscles of the calf of the leg.

Talipes cavus,—"pes cavus,"—characterized by the hollowing of the sole of the foot, with prominence of the instep, the result of paralysis of the calf muscles with contraction of the long flexor of the toe or the long peroneus—the foot flexors.

Diagnosis. The recognition of acute poliomyelitis is not always possible at the onset or during its early days, as localized paralyses are difficult of detection in children, but *immobility of one leg or arm* in children with febrile symptoms or following convulsions is always an indication of poliomyelitis. After the initial stage has passed, the presence of paralysis, wasting, presence of R. D. (reactions of degeneration), loss of reflexes, and the absence of anæsthesia, render the diagnosis very easy.

Hemiplegia from acute cerebral affections in children can be distinguished from infantile paralysis by the disorders of intelligence and the special senses, and the perseverance of the normal electro-contractility.

Paralysis of myelitis occurs in older persons, and is associated with disturbances of the genito-urinary organs and bed-sores.

Pseudo-muscular hypertrophy, with paralysis, begins gradually, becoming progressively worse with increase in the size of the limbs.

Prognosis. More or less paralysis, with muscular wasting, always results, although there is no doubt that the extent can be greatly lessened by early recognition and treatment.

Treatment. The diagnosis during the initial fever is impossible, so that its treatment is symptomatic. On the appearance of the *paralysis*, complete *rest*, hot *spinal douche*, mild *galvanism*, and internally, *quinina*, *belladonna*, *ergota*, and *potassii iodidum*.

With the improvement that follows the above measure, use internally *tinctura nucis vomicæ*, ♏j–iij (0.06–0.2 Gm.), three times daily, or hypodermic injections of *strychninæ sulphas*, gr. $\frac{1}{16}$–$\frac{1}{100}$ (0.004–0.00065 Gm.), according to age, twice a week, and *faradism* to the paralyzed muscles.

CHRONIC PROGRESSIVE BULBAR PARALYSIS.

Synonyms. Glosso-labio-laryngeal paralysis; bulbar paralysis.

Definition. A chronic degenerative affection of certain nuclei of the medulla oblongata; characterized by a slowly progressive bilateral paralysis of the tongue, lips, palate, pharynx, and larynx, with atrophy of the tongue and lips.

Causes. Obscure. Rare before the fortieth year. Among many others may be named cold, rheumatism, gout, syphilis, and injuries about the neck.

Pathological Anatomy. "Degenerative atrophy of the gray nuclei in the floor of the fourth ventricle; with atrophy and gray discoloration of the nerve roots from the medulla, especially of the facial and hypoglossal nerves." "Atrophy and disappearance of the motor ganglion cells are always to be noted. It may be the sole lesion."

"The nerves going to the muscles exhibit sclerosis of the neurilemma, and the degenerative atrophy is found in the nerve roots coming from the bulb."

Symptoms. The disease begins insidiously. There is first noticed some *difficulty in articulation*, from want of precision in movements of the tongue, particularly in the use of the lingual consonants, *l*, *n*, *r*, and *t*, which increases until that organ is completely paralyzed. The *paralysis* gradually invades the *soft palate* and *pharyngeal* muscles, causing difficulty in deglutition, of the *orbicularis oris* preventing closure of the lips, of the *laryngeal* muscles, interfering

with *articulation*. With the increasing loss of power in the tongue and lips is also a gradual atrophy of these muscles; the atrophy usually antedates the paralysis. When the disease is fully developed, the condition of the patient is most pitiable, indeed; articulation is impaired or impossible, deglutition interfered with, the lips remaining apart allowing the saliva to dribble from the mouth and liquids to return through the nose with attempts at swallowing. As the malady progresses, the pneumogastric nucleus becomes involved, resulting in loss of voice, difficulty of respiration, and cardiac irregularity. The general health gradually suffers from insufficient nutrition and imperfect respiration, although the *mind is clear until the end*. The "reactions of degeneration" are present.

Besides the chronic bulbar paralysis, there are two *acute* forms with the same symptoms as the chronic cases, only they develop *suddenly*, one, the result of *hemorrhage into the medulla*, which at the onset has vertigo, vomiting, loss of power in the limbs, and slight sensory disturbances, all of which disappear, leaving the glosso-labio-laryngeal paralysis; the second form comes suddenly, with fever, vomiting, and loss of power in the limbs, soon disappearing, leaving the characteristic bulbar symptoms; this variety is inflammatory and closely allied to acute poliomyelitis.

Diagnosis. It can hardly be confounded with any other malady.

Prognosis. Unfavorable. The duration is from one to five years.

Treatment. Entirely symptomatic. "*Galvanism* is the most promising remedy. Stabile applications, the electrodes on the mastoid processes and in the opposite direction, galvanization of the sympathetic, and applications to the lips, tongue, and fauces, should be persistently used" (Bartholow).

PROGRESSIVE MUSCULAR ATROPHY.

Synonyms. Wasting palsy; chronic spinal muscular atrophy; chronic poliomyelitis; amyotrophic lateral sclerosis.

Definition. A chronic progressive motor paralysis and atrophy of certain groups of muscles. The paralysis proportionate to the wasting or fibrillary atrophy.

Causes. Most frequent in males between twenty-five and fifty

years of age, and in many instances is hereditary. A predisposition seems to exist in those who habitually use one set of muscles (muscular strain). Exposure to cold and damp; lead; syphilis; injuries to the spinal column. Following such acute diseases as diphtheria, measles, acute rheumatism, typhoid and typhus fevers.

Pathological Anatomy. Two theories as to the origin of the pathological changes are held: one that the initial lesion is in the cord (Charcot), the other in the muscular interstitial connective tissue (Friedreich).

The morbid alterations are of two groups—spinal and muscular.

The spinal changes consist in the atrophy and degeneration of the anterior columns, wasting and disappearance of the multipolar ganglion cells of the anterior horns, with hyperplasia of the neuroglia; rarely, the hyperplasia extends to the lateral columns (amyotrophic lateral sclerosis); also wasting, atrophy, and degeneration of the anterior nerve roots.

The muscular changes consist of a progressive wasting of the muscular tissue, with increase of the interstitial connective tissue. "The final result is that the muscle is converted into a mere fibrous band with numerous fat-cells, the development of this latter material taking place outside of the muscular elements and in the newly-formed connective tissue" (Bartholow).

Symptoms. The invasion is gradual, the disease having been in progress some weeks or months before the patient is aware of its existence.

In the immense majority of cases the disease is permanently limited to one or a few groups of muscles in the upper, or more rarely in the lower, extremities. The only muscles not yet known to be attacked are those of mastication and those that move the eyeball (Roberts).

Fibrillary contraction is an early symptom, continuing more or less marked so long as any muscular fibres remain. It consists of *wave-like movements* of the muscles, excited automatically, by draughts of air or percussion. Coincident with the wasting is *loss of power*, *disorders of sensation*, *coolness* and *pallor of the surface*.

The natural roundness and contour of the body and limbs are changed, the bones standing out in unaccustomed distinctness, giving the individual the appearance of a skeleton clothed in skin.

Four types of the disease are recognized: 1, the hand-type; 2, the juvenile type; 3, the infantile facial type; 4, the peroneal type.

The hand-type: *wasting* begins in the *hand*, and particularly in the short muscles of the thumb and the ball of the little finger—the *thenar* and *hypothenar* eminences. The complete *atrophy* of the thumb muscles produces such a change in the shape of the hand as to give it the name of the *ape-hand*. Soon, and may be at the same time, wasting of the dorsal interosseous is observed, with consequent loss of power in these muscles, producing the deformity known as *claw-hand*. Soon the deltoid and other arm muscles are involved in the wasting and contraction.

The juvenile type (Erb): a rare form, affecting the muscles of the shoulder and upper arm, and less commonly the muscles of the lower extremities. This form follows after a time in the hand-type, but Erb described cases occurring primarily in these parts. Rarely, wasting in the suprascapular muscles, with fibrillary contractions, is seen alone.

The infantile facial type: involves the muscles of expression, changing entirely the appearance of the individual and giving the eyeballs a prominence from atrophy of the surrounding muscles, not unlike exophthalmos. After a time, the muscles of the shoulder and arm are involved, except the supraspinalis, infraspinalis, and the flexors of the hand and fingers.

The peroneal type: wasting first appears in the muscles of the legs, extending to the feet, producing single or double club-foot. After a time, the muscles of the hands and arms are involved, with the consequent deformities. Vasomotor changes are observed in this type.

Rarely, all the types are more or less blended in the same individual. Usually, the *electro-contractility* is preserved so long as muscular fibres remain.

Diagnosis. When wasting palsy is fully developed, its diagnosis is a simple matter. In its early stages a doubt may exist, but attention to the history, symptoms, and progress will determine the question.

Syringomyelia often begins with muscular atrophy as a marked symptom, and may be confounded with wasting palsy, the chief points of distinction between which are: the loss of power of perceiving heat, or, often, to distinguish between heat and cold, and the appearance of trophic changes, such as a dusky or purplish hue of the hands,

with a uniform thickness resembling myxœdema, the development of blebs and ulcers, and changes in the nails. Arthropathies are sometimes met with.

Prognosis. Very unfavorable, although the danger to life is often very remote. The disease may be arrested and remain stationary for years.

Treatment. Internal medication seems to have no effect on the malady, although if mineral poisoning be suspected, *potassii iodidum* should be employed, and if syphilis be suspected, a course of *potassii iodidum* and *hydrargyrum* should be administered. *Arsenicum*, *strychninæ sulphas*, and *oleum morrhuæ*, with a generous diet, are amongst the remedies indicated.

If the disease is the result of overworking any set of muscles, these must be allowed a rest.

"The most effective remedy in wasting palsy is, undoubtedly, *galvanism*. Numerous observations attest its value when applied locally to the affected muscles" (Roberts).

I have seen improvement from the *faradic* current to the affected muscles, the strength being simply sufficient to produce contractions.

Massage is a valuable adjuvant to the electrical treatment, as are *hot sponging* and *rubbing* along the spine.

Prof. Bartholow "has apparently effected great improvement in a case, confined as yet to the left upper extremity, by the injection of glycerin solution into the wasting muscles."

SPINAL SCLEROSIS.

Synonym. Duchenne's disease.

Definition. A myelitis; an increase in the connective tissue of the spinal cord, with atrophy of the nerve structure proper.

Varieties. I. *Lateral sclerosis.* II. *Posterior sclerosis*, or *locomotor ataxia.* III. *Ataxic paraplegia.* IV. *Cerebro-spinal sclerosis.*

Causes. Generally a hereditary neuropathic diathesis; syphilis; alcoholism; mineral poisons; shock or injuries to the cord; exposure to cold and wet; mostly occurring between the ages of thirty-five and fifty-five; males more liable than females. It is said that railroad enginemen and firemen, as well as conductors and other trainmen, suffer from this and other spinal diseases by reason of the continual

concussion of railway travel. The freedom from the disease in the negro has been noted by Mitchell.

Pathological Anatomy. The changes in the cord are gradual in their development and follow a longitudinal instead of a transverse direction.

The form, consistency, and color of the cord are altered, it being atrophied, indurated, and of a grayish color.

The changes are hyperplasia of the connective tissue, with granular degeneration, atrophy, and disappearance of the proper nerve elements. The nerve roots undergo the same fibroid change. The joints undergo remarkable atrophic degeneration—the arthropathies or Charcot joints, consisting of an osseous hyperplasia, the joint enlarging to an enormous extent.

PRIMARY LATERAL SCLEROSIS.

Synonyms. Antero-lateral sclerosis; spasmodic tabes dorsalis (Charcot); spastic spinal paralysis (Erb).

Definition. A degeneration of the lateral columns of the cord; characterized by paraplegia, contractures of the muscles, with exaggerated reflexes.

Pathogeny. The exact morbid condition is still a subject of discussion. The site of the lesion is the lateral white columns, in some cases extending to the anterior horn, and involving the whole length of the cord. The changes consist in an interstitial hyperplasia of the connective tissue, and an atrophy of the nerve elements.

Symptoms. The onset of the disease is very gradual, with increasing feeling of heaviness and weakness in the limbs, progressing to a complete *paraplegia.* There are also *jerking and twitching with cramps and stiffness* of the muscles of the paretic limbs. The *spasms* of the legs gradually increase in extent as the power lessens, until at last the legs, whenever extended, pass into a condition of strong extensor spasm, rigidly fixing them to the pelvis, so that the patient lies rigid; if one leg is lifted from the couch by the observer, the other leg is moved also. The spasm may be such that the knee cannot be passively flexed by any force that can be applied to it until the spasm has lessened. When flexed, the limb is comparatively supple; but if it is then extended, the spasm instantly returns, making the

limb rigid, and often completing the extension, just as the blade of a knife opens out under the influence of its spring, "clasp-knife rigidity." Occasionally, there occur brief flexor spasms, drawing the legs up.

Seguin called attention to "a desire to micturate that is far less controllable than it should be in a healthy person."

The *knee-jerk* is greatly exaggerated, and there can also be developed *rectus-clonus* and *ankle-clonus*.

The spastic gait is characteristic, termed by Hammond "the waddle"; the legs drag behind and are moved forward as a rigid whole, the toes catching against the ground, the patient showing a tendency to fall forward.

Sensation is unaffected. As the morbid process extends upward, the superior extremities suffer in the same manner as those of the lower.

Electro-contractility early impaired and gradually declining until abolished.

Diagnosis. The gradual development of weakness in the legs, excess of myotatic irritability, and spasms with developing spastic gait render the diagnosis clear. If the symptoms develop suddenly or acutely, the morbid condition is not of the degenerative variety.

Prognosis. Complete recovery rare. If the condition is early recognized, its progress may be held in check for a long time.

Treatment. Rest of the first importance. Every means to promote the general health. If the result of lues or mineral poisons, increasing doses of *potassii iodidum*, or *aurii et sodii chloridum*. *Argenti nitras*, or *oxidum*, often retards the hyperplasia of connective tissue. Benefit may sometimes follow the use of a weak *galvanic current*, but as a rule electricity is disappointing in central diseases.

LOCOMOTOR ATAXIA.

Synonyms. Posterior spinal sclerosis; tabes dorsalis.

Definition. A chronic degeneration of the posterior columns of the spinal cord and the posterior nerve roots, characterized by loss of co-ordination, neuralgic pains in the limbs, loss of sensation and reflexes, and visceral and trophic changes.

Pathogeny. "A general disease of the nervous system, affecting

both central and peripheral portions, though mainly limited to sensory or afferent structures" (Peterson). "A progressive destructive process which has a selective influence on certain tracts in the posterior columns with their roots and ganglia and to a less extent on the peripheral nerves, particularly the optic. The nerve fibres of the cord are first involved. Their destruction is not a simple wasting, but is accompanied with evidence of irritation, such as swelling of axis-cylinders and, secondarily, proliferation of connective tissue and slight congestion" (Dana).

Symptoms. Locomotor ataxia may be divided into three periods: 1, disturbances of sensation; 2, loss of co-ordinating power; 3, paralysis.

The onset of the disease is gradual, by *sharp, darting, electric-like pains* in the lower limbs, with disorders of the gastro-intestinal and genito-urinary tracts. Associated with the pains is a *loss of sensation* in the feet, the patient being unable to distinguish between hard and soft substances in walking, and, if the upper portion of the spinal cord be affected, is unable to co-ordinate the muscles of the fingers sufficiently to button his clothing. A sensation of formication over the surface, especially over the lower limbs, and about the waist, the knee, and the ankle, is present; there is nearly always a feeling of constriction about the trunk—the girdle.

Loss of co-ordination, or ataxia, the subject being unable to walk upon a straight line with his eyes closed, and with difficulty if his eyes are opened. Inability to preserve the erect position with the feet close together, the body swaying widely and the patient falling on standing with closed eyes,—Romberg's symptom, and as the malady progresses he throws his feet and legs in the most grotesque manner when walking. Although the patient is unable to co-ordinate the muscles, their power is not lost, for, on being supported, he can kick or strike with his usual force.

The *sight* is early impaired, due to atrophy of the optic nerve, causing either double vision or inability to distinguish between different colors. Very early there is loss of pupil reflex to light, the reaction to accommodation being present—Argyll-Robertson symptom. As the disease progresses, sensation becomes more and more blunted and pain is slowly recognized, frequently several minutes elapsing before the pricking of a pin is appreciated. A characteristic sign of the disease is the *abolition of the patellar-tendon reflex*—Westphal's symptom—as well as other reflexes in the lower limbs. Loss of the

sensation of temperature also occurs. The *electro-contractility* is decreased in the affected limb. General emaciation is marked.

Vasomotor and trophic symptoms, more or less pronounced, occur in all cases. "Perforating ulcers" of the feet, loss of hair in spots, changes in the nails, and local sweatings are the more common. Muscular atrophy, either localized or general, is not infrequent.

Fränkel, under the term "hypotonia," describes a condition found in tabetic persons in which the patient, lying on a flat surface, can completely straighten his legs when at right angles to the body, which cannot be done by a normal man, whose knees will be bent when legs are at right angles with body.

Either early or late in the disease occur disturbances in micturition and loss of sexual power and often desire. There also occur, in a fair number of cases, *painless swelling* and disintegration of various joints, particularly the knee and elbow—*the tabetic arthropathies*, or *Charcot joints*.

At any period of the disease peculiar *crises* or neuralgic attacks occur; if griping pains in stomach with vomiting, gastric crises; if renal pain or colic with disturbed urinary flow, nephralgic crises; if pain in bladder, vesical crises; if pain in rectum with hæmorrhoids, rectal crises; if severe paroxysm of coughing, bronchial crises; if constriction of the throat with dyspnœa, laryngeal crises; if cardiac pain and tachycardia, cardiac crises.

Paralysis finally ends the suffering of the patient. There is generally an entire absence of cerebral phenomena, although rarely delusions or dementia develop toward the end of the malady.

Diagnosis. There are three pathognomonic symptoms of locomotor ataxia, the presence of which makes the diagnosis positive; they are Westphal's symptom—absence of patellar reflex; Romberg's symptom—swaying of body and inability to maintain erect position with closed eyes; the Argyll-Robertson symptom—loss of pupil reflex to light, but reaction to accommodation retained; Fränkel's symptom—hypotonia.

Chronic myelitis is characterized by paralysis, and the course of the affections are otherwise so different that an error should not occur.

Disease of the cerebellum presents symptoms of disordered co-ordination, but they are the result of vertigo, and associated with headache, nausea, and vomiting, with absent neuralgic pains and eye symptoms.

Paraplegia is a true paralysis, while locomotor ataxia is not. Neuralgic pain is not a symptom of paraplegia.

Multiple neuritis shows loss of power with pain, but does not present the three pathognomonic symptoms mentioned above.

Prognosis. Unfavorable. Rarely the progress has been retarded for a long time. There are some claims of recoveries of locomotor ataxia in the early stage, but that a cure of a genuine case, extending to the second stage, is ever effected seems very questionable.

Treatment. In the management of locomotor ataxia, *rest*, as nearly absolute as possible, is of the first importance. It will be all the more effective if it be in bed for a period of several months.

Following the suggestion of Erb, use may be made of *cold along the spine*, in the shape of cold sponging, cold spinal pack, or short applications of the cold douche to the spine. The *galvanic continuous current* along the spinal column is warmly advocated, with *faradism* to the wasting muscles.

Potassii iodidum, or *hydrargyri chloridum corrosivum*, in full doses, or *aurii et sodii chloridum*, gr. $\frac{1}{20}$ (0.003 Gm.), three times a day, often remarkably retard the progress of the affection. The best results are obtained, however, from *argenti nitras*, gr. ¼–½ (0.016–0.03 Gm.), or *oxidum*, gr. ½ (0.03 Gm.), three times a day, withholding it at intervals of a few weeks to prevent discoloration of the skin (argyria).

Temporary success at least seems to have followed, in some cases of locomotor ataxia in the second stage, from the "*suspension treatment*" recommended by Charcot. The treatment consists in the suspension of the patient during a period varying from one to four minutes, by means of the Sayre apparatus for applying the plaster jacket in spinal deformities.

The severe and sharp pains require treatment, at first giving preference to any of the substitutes of opium, but finally *opium* itself will have to be resorted to. The actual cautery applied to the back once a month is said to relieve the pains.

The diet should be of a nutritious, easily-assimilated character. Nutrition can also be promoted by the use of *oleum morrhuæ*, and *syrupus calcii lacto-phosphatis*, or the hypophosphites and strychnina.

ATAXIC PARAPLEGIA.

Synonyms. Combined lateral and posterior sclerosis; antero-lateral sclerosis.

Definition. A chronic degeneration of the lateral pyramidal

tracts and of the posterior columns of the spinal cord; characterized by gradually developing paraplegia, with ataxia and spasms of the limbs.

Causes. The causes are not so well determined as in other varieties of spinal sclerosis.

Pathogeny. A sclerosis of the lateral and posterior columns of the spinal cord. It is to be noted that the posterior columns show the morbid changes higher up than in locomotor ataxia,—the dorsal rather than the lumbar regions,—and that the root-zone of the postero-external column is much less involved. Nor do the lateral tracts show the same degree of involvement as in spastic paraplegia.

Symptoms. The onset is slow and gradual, with *loss of power* in the lower extremities. The muscles involved are particularly the flexors of the thigh and knee. One leg may be weaker than the other. There is also *ataxia*, the patient being unsteady when standing with feet together (tabetic swaying), and he tends to fall if the eyes are at the same time closed. *Spasms* of the lower extremity gradually develop and finally become as marked as in spastic paraplegia. The *knee-jerk* reflex is increased, quick and extensive, and rectus- and ankle-clonus can be developed. The sexual power is early lost. Incontinence of urine is frequent. *Sensation is unimpaired* and neuralgic pains are absent, as are eye symptoms.

Diagnosis. The conditions ataxic paraplegia is most liable to be mistaken for are locomotor ataxia and spastic paraplegia. The presence of knee-jerk and loss of power in lower extremities are of value in discriminating from locomotor ataxia. Spastic paraplegia is not associated with ataxia—indeed, ataxic paraplegia is spastic paraplegia *plus* inco-ordination.

Prognosis. Unfavorable. The condition is progressive.

Treatment. The same plan of treatment may be tried as recommended for lateral or posterior sclerosis.

CEREBRO-SPINAL SCLEROSIS.

Synonyms. Multiple sclerosis of the brain and cord; cerebral sclerosis; spinal sclerosis; disseminated sclerosis (Charcot).

Definition. A degenerative disease of the brain and spinal cord; characterized by pains in the back, disorders of sensation, loss of

co-ordination, tremor on motion, scanning speech, and some mental impairment.

Pathogeny. The disease consists in the development of patches of grayish, translucent, tough nodules, varying in size from a minute microscopical object up to the size of a walnut, varying in number and widely distributed in the white matter of the hemispheres, ventricles, optic thalamus, corpus striatum, peduncles, pons, and cerebellum, while in the cord they are found in both the white and gray matter and in the columns. The deposits are also found in the nerve roots and nerve trunks. The nodules are composed of the neuroglia, much altered, and a newly-formed connective tissue. The result of the growth of the nodules is pressure upon the nerve structure, ending in its degeneration.

Symptoms. Charcot divided disseminated sclerosis into three varieties, depending upon the site of the marked changes, as the brain, the cord, or a combination of the two. The latter variety is the more common.

Rarely, the malady is ushered in with apoplectiform symptoms, but generally the onset is insidious, with *pains* more or less severe in the *limbs and back*, which are attributed by the patient to rheumatism. Also a feeling of formication, itching, and burning in the limbs. *Loss of co-ordination* of the hands in writing, or the feet in walking, or a jerky co-ordination, followed after a time by *paresis*, more or less general, with *contracture* of the muscles. Voluntary movements of the paretic limbs develop a *tremor*—the *shaking tremor*—which subsides when the limbs are at rest—intention tremor, with shaking of head. An early and frequent condition is *nystagmus*. The loss of co-ordination, with tremor and with contractures of the muscles of the legs, has given rise to the "waddle," or "hop" gait when walking. There are also present *headache*, *vertigo*, *mental impairment*, with an unnatural contentment of the feelings and with the surroundings. A *scanning or slurring speech;* disorders of *vision*, from optic-nerve atrophy, and *hearing; sexual disturbances*, *vesical disorders*, gastric and other crises, and often the development of bed-sores.

Knee-jerk and *wrist-jerk* are exaggerated, and ankle-clonus is present.

The disease is progressive, the symptoms developing as the various nerve tracts are invaded.

Persons with multiple sclerosis are very liable to develop pulmonary consumption or chronic nephritis.

Duration. Ranges from a year to twenty years, an average being five or ten years.

Diagnosis. Keeping in mind the following general symptoms an error can be avoided: *pains* in limbs and back, *loss of co-ordination* in the feet and hands, muscular weakness with *contractures*, intentional *tremor*, *nystagmus*, scanning speech, disordered vision, increased tendon reflexes, and vertigo.

Paralysis agitans may be mistaken for disseminated sclerosis. The chief points in the diagnosis are the presence in paralysis agitans of the fine *tremor continually* without shaking of the head, with a peculiar flexion and rigidity of the hand, while in cerebro-spinal sclerosis the tremor is produced only on movement of the muscle, and is associated with shaking of the head. Paralysis agitans, a disease of middle life, sclerosis under forty years. Changes in the voice, speech, and vision are present in cerebro-spinal sclerosis, but absent in paralysis agitans.

Tumor of the pons or crus is accompanied with wild, jerky incoordination closely resembling disseminated sclerosis, but tumor also has headache, vomiting, optic neuritis, local spasm, and local paralysis.

General paralysis of the insane and disseminated sclerosis are frequently confounded, as are locomotor ataxia and primary lateral sclerosis.

Prognosis. Unfavorable. The disease slowly but steadily progresses, chronic nephritis or tuberculosis frequently developing and causing death.

Treatment. There is no drug having the power to cure sclerosis. Syphilis has been the cause of the vast majority, if not all, of the cases observed by the writer, and *potassii iodidum*, in large doses, or the following has seemed in a few instances to hold the disease in check for a time:

℞. Hydrargyri chloridi corros., . . gr. j	.065	Gm.	
Liq. arsenici chloridi, ... f℥j	4.	Cc.	
Inf. gentian., ... ad f℥iij	ad 90.	Cc.	M.

Sig.—Teaspoonful three times daily, in water.

Attention to the general health and remedies to promote constructive metamorphosis will prolong life and add to the comfort of the individual.

SYRINGOMYELIA.

Synonym. Syringomyelitis.

Definition. A chronic disease of the spinal cord, characterized by the formation of cavities in the substance of the cord, associated with loss of the perception of pain and temperature over certain regions, and complicated with muscular weakness and atrophy, and, at times, trophic changes.

Causes. Not a frequent condition. Seen oftener in men than in women. The etiological factors not determined. It is a disease of early life, beginning before thirty.

Pathological Anatomy. There are present a tubular cavity or cavities in the substance of the spinal cord. There is considerable difference of opinion as to how these cavities develop. It is thought that they may originate in either "a faulty closure of one of the divisions of the primary central canal of the cord, for in the course of development the primary central canal of the cord becomes divided into two parts—an anterior and a posterior. The anterior division forms the permanent central canal. The walls of the posterior division gradually come together and form the posterior fissure. The imperfect closure of either of these divisions of the primary central canal may give rise to syringomyelia. Or, the abnormal cavity or cavities may depend on the disintegration of a gliomatous formation which originates generally in embryonal tissue about the central canal. The cavity varies in extent and location in different cases, so that it is possible to find marked evidences on autopsy which presented no symptoms during the lifetime of the individual. But usually the cervical cord is the seat of the disease.

Symptoms. The condition develops slowly and insidiously, and nearly always bilaterally. There occur loss or diminution of the perception of temperature (heat and cold) and pain, the *tactile sense being retained;* slowly developing muscular atrophy, due to involvement of the anterior horns of the cord. The atrophy usually affects the arm and shoulder of one or both sides, and it may begin in the hand. Associated with the muscular atrophy is muscular weakness and more or less fibrillary contractions. When the weakness involves the spinal muscles, scoliosis occurs. Arthropathies occur in many cases, particularly involving the shoulder-

joint. Trophic changes also involve the skin, often advancing to ulceration and even gangrene, and rarely to painless felons, such as occur in Morvan's disease.

The disease is seen in many irregular types, the loss of temperature sense in one part and the loss of sensation of pain in another, and other irregular distribution of the characteristic phenomena.

The general health of patients suffer but little in syringomyelia.

Diagnosis. Progressive muscular atrophy is apt to be confounded with syringomyelia unless the changes in the temperature and pain senses are remembered. Morvan's disease is by many neurologists classed as a variety of syringomyelia.

Prognosis. Incurable, but of long duration; often many years, with periods of quiescence.

Treatment. Entirely symptomatic.

DISEASES OF THE NERVES.

SIMPLE NEURITIS.

Definition. An inflammation of the nerve trunks; characterized by pain, impaired sensation, motor paralysis, and atrophy.

Causes. Wounds and injuries or compression of nerves; cold and damp; syphilis (?); lead.

Pathological Anatomy. Hyperæmia, followed by exudation into the nerve sheath and connective tissue, "which becomes softened and ultimately breaks down into a diffluent mass." Migration of white corpuscles takes place into the neurilemma. Recovery may occur before destruction of the nerve elements is produced, absorption of the exudation occurring. "It is important to note that when inflammation occurs in a nerve it may extend from the point first diseased upward (*neuritis ascendens*) or downward (*neuritis descendens*)."

Symptoms. The onset may be accompanied with *febrile reaction*. The most decided symptom is *pain* along the course of the

nerve trunk and its peripheral distribution, of a *burning*, *tingling*, *tearing*, *intense* character, increased by pressure or motion. If the affected nerve be a mixed one,—sensory and motor,—*spasmodic contractions* and *muscular cramps* occur, followed by impaired motion, terminating in *paresis* of the muscles innervated by the affected trunk. The sense of touch and of pain are markedly impaired, while the temperature and muscular sense are but slightly disturbed.

If the inflammation proceed to destruction of the nerve trunk, wasting and degeneration of the muscular tissue ensues. Various trophic changes also occur, such as cutaneous eruptions and clubbing of the nails. The *electro-contractility* is impaired or lost.

Diagnosis. Myalgia or muscular pain is not associated with paralysis, nor does the pain follow the course of a nerve trunk.

Neuralgia has the pain, but, as a rule, not the tenderness of neuritis.

Prognosis. Generally favorable, with proper treatment.

Treatment. Repeated *blistering* along the course of the nerve, preferably with the Paquelin cautery or a poker at white heat, with full doses of *potassii iodidum*, are usually successful. *Sodii salicylas*, *phenacetin*, and *antifebrin* are often valuable, but for severe pain no drug is to be compared with *morphinæ sulphas* by the hypodermic method. From the onset *quininæ sulphas*, gr. ij–v (0.13–0.3 Gm.) every four hours, is most valuable, and if the attack be due to exposure to cold or damp, combine *sodii salicylas*, gr. ij–v (0.13–0.3 Gm.), in capsule.

As the more acute symptoms subside, the use of *galvanism* or a feeble, slowly interrupted *faradic* current restores the disordered function of nerve and muscle.

If anæmia be present, make use of *ferrum*, with malt and the hypophosphites.

MULTIPLE NEURITIS.

Synonyms. Polyneuritis; peripheral neuritis; disseminated neuritis; degenerative neuritis; pseudo-tabes; alcoholic paralysis; beri-beri (Brazil and India); kakké (Japan).

Definition. A parenchymatous inflammation of a number of symmetrical peripheral nerves, simultaneously or in rapid succession; characterized by pain, numbness, loss of power, or ataxia, with muscular atrophy. Mental symptoms are often associated.

Causes. Alcoholism; syphilis; malaria; lead, arsenic, or silver; following diphtheria, typhoid fever, and rheumatism.

Beri-beri and kakké are epidemic varieties of multiple neuritis, the result of a special poison.

The probability is that the various causes named develop in the blood a poison, having a particular susceptibility or "selective action" for nerve-fibres.

Pathological Anatomy. The affection is generally bilateral and symmetrical. An important characteristic is its peripheral distribution, the inflammation being most intense at the extremities of the nerves, lessening progressively toward the centre, usually terminating before the nerve roots are reached. The inflammatory process affects the nerve-fibres primarily and the sheath and connective-tissue secondarily—a parenchymatous inflammation. The affected muscles are paler and smaller than normal, the fibres reduced in size and undergoing granular changes.

Symptoms. All plans yet suggested for classifying the varieties of multiple neuritis are imperfect. The onset may be sudden, even overwhelming, causing rapid death, but is usually subacute or chronic in its course, the symptoms being wide-spread in proportion to the acuteness, intensity, and cause of the malady. The symptoms may be described under three forms—*a motor*, *a sensory*, and an *ataxic form*.

The *motor* form shows motor weakness, chiefly involving the flexors of the ankles, the extensors of the toes, and the extensors of the wrist and fingers in the forearms. Inflammation of the anterior tibial or peroneal nerve in the leg, and the radial branch of the musculo-spiral in the arm, resulting in the double "foot-drop" and "wrist-drop" so characteristic of this disease. Any nerves of the body may be affected, the symptoms varying with the particular nerves.

The *sensory form* shows *pains*, *tenderness*, *tingling*, and *numbness* with loss of cutaneous sensibility.

At times the hyperæsthesia of the extremities is so marked, and especially that of the soles of the feet and the muscles, that the slightest touch cannot be tolerated.

The *ataxic form* shows inco-ordination with or without sensory disturbances, but with loss of the muscular sense.

The forms may all be associated, in greater or less extent, in any one case.

Muscular atrophy begins early and progresses with the disease.

The *knee-jerk* is feeble or absent. The electro-contractility is feeble or lost.

In alcoholic cases, there may be delirium, mania, and delusions, associated with tremors.

Foot-drop is a typical symptom in alcoholic neuritis.

Trophic changes may occur in the nails, hair, and skin. The characteristic glossy condition of the skin, with some œdema, is due to involvement of the vaso-motor nerves. Rarely the vagus, optic, and laryngeal nerves are involved.

The disease may be ushered in with fever, 101° F.–103° F.; rapid, feeble pulse; headache, nausea, vomiting, with delirium or confusion.

The alcoholic variety affects chiefly all the limbs, beginning in the flexors of the feet; the malarial, the legs; diphtheria, the pharyngeal and motors of the eye; rheumatic, the face; and lead, the arms.

Beri-beri, or endemic neuritis, is an infectious form of multiple neuritis due undoubtedly to micro-organisms. It is claimed that some defect in diet is a predisposing cause of this variety. The symptoms and development are much the same as seen in other varieties with the addition of *œdema* and a tendency to effusions into the serous cavities and a cardiac involvement. In severe cases the pain is intense and the wasting rapid.

Diagnosis. In no disease is an early diagnosis so important from a therapeutical standpoint. Early treatment may prevent months of suffering and idleness.

Since the symptoms of this wide-spread affection have been properly separated from diseases of the spinal cord, with which they were formerly always associated, the diagnosis is very readily determined.

Loss of power is an early symptom, usually beginning in the feet and extending upward so that multiple neuritis may be mistaken for Landry's paralysis. Ross considers these affections identical, but usually Landry's paralysis is a cord disease.

Prognosis. As a rule, favorable if early and proper treatment be instituted.

Treatment. Rest is of the greatest importance; the more thoroughly this is carried out, the better will be the results.

Removal of the cause is an important indication. Warmth to the

affected parts by flannel next to the skin, hot baths, and keeping the parts wrapped in cotton-wool.

There is no specific drug for polyneuritis. For alcoholic cases use *strychninæ nitras;* for malarial cases, *quininæ sulphas;* for diphtheritic cases, *tinctura ferri chloridi* and *strychninæ sulphas;* for rheumatic cases, *sodii salicylas*, *salol*, or *phenacetin;* for syphilitic cases, *hydrargyrum* or *potassii iodidum;* for lead or other mineral poison cases, the *iodides;* and in all varieties, tonics with a generous nutritious diet.

Pain should be relieved with either *antifebrin*, or *morphinæ sulphas*, by the hypodermic method. As convalescence begins, moderate exercise and mild galvanism. *Arsenicum* is considered the best constructive tonic for the convalescence of multiple neuritis.

NEURALGIA.

Definition. A disease of the nervous system, manifesting itself by sudden pain of a sharp and darting character, mostly unilateral, following the course of the sensory nerves.

Varieties. I. *Neuralgia of the fifth nerve;* II. *Cervico-occipital neuralgia;* III. *Cervico-brachial neuralgia;* IV. *Dorso-intercostal neuralgia;* V. *Lumbo-abdominal neuralgia;* VI. *Sciatica;* VII. Erythromelalgia (Mitchell).

Causes. Hereditary. Anæmia; malaria; syphilis; metallic poisons; anxiety; mental exertion; exposure to cold and damp; injuries of a nerve trunk.

Pathological Anatomy. The old axiom of neuralgia being "the cry of the nerves for pure blood" is perhaps only part of the truth. The changes in the nerve trunks or centres have not as yet been fully determined. A fair number of cases present the changes of neuritis.

NEURALGIA OF THE FIFTH NERVE.

Synonyms. Tic-douloureux; Fothergill's disease.

Symptoms. *Paroxysmal pain*, of a sharp, darting, stabbing character, most common at points along the course of the supra- and infra-orbital branches of the fifth nerve of the left side, attended with *increased lacrymation.* When of any duration, nutritive changes are observed in the nervous distribution, such as *œdema* along the course of the nerve, *gray eyebrows*, and *convulsive twitches* of the muscles,

termed "*tic-douloureux*," *tenderness* at the infra- and supra-orbital foramina, as well as along the course of the nerve distribution.

CERVICO-OCCIPITAL NEURALGIA.

Symptoms. *Paroxysmal pain*, of a sharp and lancinating, or deep, heavy, tensive character, along the course of the occipital nerve upon one or both sides, extending from the vertex, and on the neck as far down as the clavicle, and upward and forward to the cheek. May be associated with *hyperæsthesia* of the skin, and with *cramps* in the cervical muscles, and with attacks of *herpes*. A sensation of *cracking* at the nape of the neck is an annoying symptom in many cases.

CERVICO-BRACHIAL NEURALGIA.

Symptoms. *Paroxysmal pain* of a severe, boring, burning, or tensive character, with *sensations of numbness and weakness* of the arm, hand, shoulder, scapula, and mamma, with tenderness along the cervical plexus. *Œdema* of the arm and other parts along the distribution of the cervical plexus occur if the neuralgia be of long duration, the result of nutritive changes, the limb at times becoming pale, the skin glossy, dry, and harsh.

DORSO-INTERCOSTAL NEURALGIA.

Symptoms. *Paroxysmal pain* of a sharp, and lancinating character, along the fifth and sixth intercostal spaces, often associated with the development of herpes, the so-called *herpes zoster*, or "shingles."

Tenderness at the points where the nerves emerge from the intervertebral foramina at the sides of the chest and at points in front.

LUMBO-ABDOMINAL NEURALGIA.

Symptoms. *Paroxysmal pain* of a sharp and lancinating, at times heavy and dull, character, following the course of the ilio-hypogastric nerve, ilio-inguinal and external spermatic nerve, supplying the integument of the hip, the inner side of the thigh, the scrotum and labium.

SCIATICA.

Definition. A neuritis. Pain following the course of the sciatic nerve. The sacral plexus is made up of the fourth and fifth lumbar and the first two pairs of sacral nerves.

Symptoms. Sciatica usually follows an attack of lumbago, the pain becoming fixed in the sciatic nerve; at times it is a true neuritis.

The pain is sharp, tearing, shooting, or lancinating in character, increased upon motion, shooting along the course of the nerve into the hip, inner side of the thigh, calf of the leg, ankle, and heel, at one or all of these points, in paroxysms lasting from a few hours to twenty-four hours or longer. The tactile sensation in the foot and motility in the limbs are impaired, and if of long duration, wasting of the limb occurs.

ERYTHROMELALGIA.

Synonyms. "Red neuralgia."

Symptoms. This form of neuralgia was first described by Dr. S. Weir Mitchell. The *feet* principally, are affected by *intense redness* and *burning pain*. For a considerable period before the condition is typically developed there are aching pains in the feet, particularly when used. The feet, in Dr. Mitchell's own words, "get redder and redder, the veins stand out in a few minutes as if a ligature had been tied about the limb, and the arteries throb violently for a time, until at length the extremities become of a dark purplish tint." As a rule, the redness only occurs when the feet hang down, and when at rest they may be pale and perspire freely. Blisters and ulcers follow slight contusions of the feet.

Diagnosis. Erythromelalgia has been confounded with Raynaud's disease. The presence of pain, bright redness, throbbing, and increased temperature of the part are all the opposite of Raynaud's disease.

PROGNOSIS OF NEURALGIAS.

If promptly and properly treated, unless the result of pressure of an exostosis, aneurism, or other tumor, favorable, save for erythromelalgia.

TREATMENT.

Rest; easily assimilated but nutritious diet; removal of the cause, if possible. If anæmic, *ferrum* and *arsenicum*. If rheumatic, *alkalies* and *sodii salicylas*. If syphilitic or the result of metallic poisons, *potassii iodidum*. If malarial, *quininæ sulphas*, or *hydrochloras*.

For an attack, *morphinæ sulphas* and *atropinæ sulphas*, hypodermically, afford the most prompt and ready relief.

Success usually follows the use of the well-known "Gross (Prof. S. D.) neuralgic pill":

℞. Quininæ sulphat., ... gr. ij .13 Gm.
Morphinæ sulphat., ... gr. $\frac{1}{20}$ .003 Gm.
Strychninæ sulphat., ... gr. $\frac{1}{30}$ .002 Gm.
Acidi arseniosi, ... gr. $\frac{1}{20}$ .003 Gm.
Extracti aconiti, ... gr. $\frac{1}{2}$ .032 Gm.
Ft. pil. No. j.
Sig.—One every one, two, or three hours.

Few attacks of trigeminal neuralgia will resist the following powerful prescription:

℞. Aconitinæ (Duquesnel), . . . gr. $\frac{1}{10}$ .006 Gm.
Glycerini,
Alcoholis, ... āā f℥j āā 4. Cc.
Aquæ menth. pip., ... ad f℥ij ad 60. Cc.
Sig.—Teaspoonful, repeated from four to eight times daily, carefully watching.

For the pains of *intercostal neuralgia*, the following is recommended:

℞. Chloral, ... ℥j 4. Gm.
Pulv. camphoræ, ... ℥j 4. Gm.
Menthol, ... ℥j 4. Gm.
Mix and rub together.
Sig.—Paint over painful parts with brush, p. r. n.

Facial neuralgia is often wonderfully benefited by the internal administration of *extractum gelsemii fluidum*, ♏ iij–v (0.2–0.3 Cc.), every three or four hours until its physiological effects are produced; cannabis indica or belladonna may be combined with the gelsemium. Excellent results often follow the administration of *Moussette's pills* (aconitine and quinine).

For sciatica, *antipyrin*, gr. xx (1.3 Gm.), repeated two or three times daily, has given relief, as has *phenacetin* and *antifebrin*. The *deep injection of chloroformum* is recommended by Bartholow. *Nitro-glycerinum* has been strongly recommended for sciatica, beginning with one drop of a one per centum solution three or four times a day and gradually increasing the dose until four or five drops several times daily are taken. Dr. Mitchell is a strong advocate of the application of a flannel bandage for the entire leg, changed daily, and a splint reaching from the axilla to the heel, held loosely to the limb, and tonics. Rarely, he uses *cocainæ hydrochloras* gr. $\frac{1}{4}$ (0.016 Gm.) hypodermically over a painful spot. A spray of *chloride of methyl* along the course

of the nerve for a few moments, watching the skin, will relieve the distressing pain. Rarely, full doses of *potassii iodidum* with a *blister* along the course of the nerve gives relief.

For erythromelalgia all drug treatment has failed to cure. Rest and elevation of the limb gives relief. Dr. Mitchell recommends either nerve stretching, and in aggravated cases nerve excision.

All forms of neuralgia are more or less benefited with—

℞. Quininæ sulph., ...	gr. iij	.2	Gm.
Ferri reduct, ...	gr. j	.065	Gm.
Acid. arseniosi, ...	gr. $\frac{1}{20}$	.003	Gm.
Aconitiæ, ...	gr. $\frac{1}{120}$	.00054	Gm.

In pill, every four or five hours.

FACIAL PARALYSIS.

Synonym. Bell's palsy.

Definition. An acute paralysis of the seventh cranial,—the facial nerve, the great motor nerve of the muscles of the face,—the *nerve of expression.*

Causes. Exposure to a current of cold air against the side of the face—over the *pes anserinus*—is the most frequent cause. Also due to injury or disease of the middle ear. Syphilis.

Symptoms. The facial nerve supplies the muscles of the face, the muscles of the external ear, also the stylo-hyoid, posterior belly of the digastric, the platysma, one muscle of the middle ear, the stapedius, and one palate muscle, the levator palati; by means of the chorda tympani branch it controls the secretion of the parotid and submaxillary glands, and, possibly, the sense of taste. It also furnishes motor power to the azygos uvulæ, the tensor tympani, and the tensor palati muscles.

The onset is usually sudden, with *tingling of the lips and tongue*, and upon looking into the mirror the patient is surprised by the perfectly blank, motionless side of his face; the corner of the mouth is depressed, the eyelids open, the face drawn toward the well side, and the patient is unable to expectorate, whistle, or swallow.

Any of the muscles innervated by the nerve may participate in the paresis.

The *electro-contractility* is feeble or lost. The *reflexes* are abolished.

Diagnosis. Paralysis of the muscles of the face occurs in hemiplegia; the points of differentiation are the presence of cerebral symptoms and the normal reflex excitability.

Facial palsy with otorrhœa, imperfect hearing, obliquity of the uvula, and loss of taste determine its origin within the aquæductus Fallopii.

It is due to peripheral neuritis if the taste be normal and the uvula straight.

If other nerves are also involved, the origin is central.

Prognosis. Favorable.

Treatment. If the result of cold and damp, diaphoresis with *pilocarpus*, or diuresis with *potassii acetas*, *vel iodidum*, and *blisters* in front of the ear, and the use of *galvanism* to the affected muscles.

GENERAL OR NUTRITIONAL DISEASES.

CHOREA.

Synonyms. St. Vitus' dance; insanity of the muscles.

Definition. A functional (?) disorder of the nervous system; characterized by irregular spasmodic fibrillary movements of groups of muscles, with muscular weakness, more or less approaching paralysis of the affected parts.

Causes. Essentially a disease of childhood; hereditary; reflex, from dentition, worms, masturbation, or fright; probably the result of rheumatism in many cases.

Pathological Anatomy. As yet there has been no constant anatomical lesion discovered, the theory of emboli having, however, many advocates.

Symptoms. The onset is usually gradual, the child seemingly grimacing or jerking the arm or hand, as if in imitation, followed soon by decided *irregular jactitations* of the muscles of the face (histrionic spasm), of the eyelids (blepharospasm), eyeballs (nystagmus), and the shoulder, arm, and hand, finally extending to the lower extremi-

ties, interfering with *motility;* in severe cases, inability of self-feeding or of holding anything in the hands. The *speech* is often unintelligible, the tongue constantly moving in an irregular manner.

The *heart's* action is tumultuous and irregular, associated often with a soft, blowing, systolic murmur, most distinct at the base. The muscles are usually quiet during sleep, although this is not always the case. The mind is somewhat blunted, the temper irritable, the memory impaired. If the irregular muscular movements are confined to one side of the body, it is termed *hemi-chorea.*

Diagnosis. Chorea was confounded with epilepsy until the points of distinction were pointed out by Sydenham.

Huntington's or *chronic chorea* is distinctly hereditary, and, instead of being fibrillary contraction of muscles, involves whole groups of muscles, so that the patient seems to be posturing and grimacing, with a dancing movement, with many queer contortions of the face and head. Generally, all the muscles of the body are involved. It may have associated the fibrillary muscular contractions of St. Vitus' dance.

Paralysis agitans has general muscular tremor, beginning in one limb, gradually progressing, uninfluenced by treatment; a disease of the elderly.

Post-hemiplegic chorea is the choreic movement of a paralyzed limb.

Prognosis. The vast majority of cases recover, but relapses are very frequent.

Treatment. Remove the cause, if possible. Easily assimilated diet. Many cases improve rapidly by confinement to bed in a darkened room. If the muscular movements interfere with sleep, *morphinæ sulphas* or *chloral* are indicated. Regulate the secretions.

Arsenicum is the most reliable remedy yet introduced for the treatment of chorea. It should be pushed to its first physiological effects, then gradually reducing the dose until all symptoms disappear. The form of the remedy best adapted for administration in this disease is *liquor potassii arsenitis*, ♏v (0.3 Cc.), increased to ♏x (0.6 Cc.), or even ♏xv (1 Cc.), three times a day. *Extractum cimicifugæ fluidum*, ♏xx–f℥j (1.3–4 Cc.), t. d., is serviceable, especially in cases following a rheumatic attack. Cases resisting the arsenicum treatment may rapidly improve under *hyoscyaminine hydrobromas*, gr. $\frac{1}{200}$–$\frac{1}{100}$ (0.00032–0.00065 Gm.), three times daily. A patient of mine, aged sixteen

years, who resisted all the remedies mentioned, was promptly cured by *antipyrin*, gr. x (0.6 Gm.), four times daily. This same lad had a former attack arrested by *morphinæ sulphas*, gr. ¼ (0.016 Gm.), four times daily, but this latter remedy failed in the attack controlled by the antipyrin. If anæmia be present, combine or alternate *arsenicum* with *ferrum*. Wood recommends *quininæ sulphas*.

EPILEPSY.

Definition. A chronic disease, of which the characteristic symptoms are a sudden loss of consciousness, attended with more or less general convulsions.

Causes. True epilepsy almost always first arises during the growth and development of the brain. Heredity. Rarely, worry, anxiety, depression, or fright. Pressure from a tumor at the periphery, or thickening of the membranes of the brain causing pressure; syphilis; uterine diseases.

Pathological Anatomy. There are no constant anatomical lesions, as yet, associated with essential epilepsy.

In "Jacksonian," "cortical," or "partial epilepsy," however, the "motor cortex" is irritated by disease and there occur tonic and clonic spasms of the same character as in general epilepsy, confined to a single arm, or an arm and half the face together, or may be the entire half of the body. These epileptiform attacks furnish precise data as to the locality of the lesion; spasms affecting the distribution of the facial nerve point to the lower third of the central convolution; of the arm, the middle third of the central convolution; of the lower extremity, the upper third of the central convolution.

Varieties. I. *Epilepsia gravior*, le grand mal; II. *Epilepsia mitior*, le petit mal.

Symptoms. *Le grand mal* is preceded by a more or less pronounced and curious sensation, the so-called *aura epileptica*.

The *attack* proper is *sudden*, the subject *suddenly falling*, with a *peculiar* cry, *loss of consciousness*, and *pallor of the face*, the body assuming a position of *tetanic rigidity*, succeeded after a few moments by more or less pronounced *clonic convulsions* followed by *coma* of several hours' duration. The subject awakens with a confused or sheepish expression, with no knowledge of what has

occurred, unless he has injured himself during the attack, either by the fall, or, what is very common, has *bitten his tongue* during the convulsions.

Le petit mal is manifested either by attacks of *vertigo*, the consciousness being preserved, or by a *passing absent-mindedness*, either form being associated with *slight convulsive* phenomena followed by slight *coma* or mental confusion of short duration.

The mental functions are not, as a rule, injured by attacks of epilepsy, unless they recur very frequently. Indeed, when at wide intervals, the subject seems relieved by them, "the sudden, excessive, and rapid discharge of gray matter of some part of the brain on the muscles," the so-called "electrical storm," having cleared the cerebral atmosphere.

The great majority of epileptics suffer from chronic gastric catarrh, and have at the same time an inordinate appetite (boulimia); indeed, an attack of gluttony may immediately precede a fit.

Epileptics are very liable to the development of tuberculosis and of nephritis.

Diagnosis. *Uræmic convulsions* closely resemble an epileptic attack; but the dropsy or general œdema and albuminous urine, and increased temperature of the former should guard against error.

Feigned epilepsy often misleads the most practical expert.

Jacksonian epilepsy begins as a spasm of a limb or some portion of a limb, and is confined there or may gradually extend until even a general convulsion occurs.

Prognosis. The vast majority of cases will not recover under treatment, but have the frequency and severity of the attacks greatly ameliorated, but sooner or later returning with their former severity. Cases the result of the various reflex causes usually recover when the cause is removed.

Treatment. To avert an impending attack, inhalations of *amyl nitris*, ♏iij–v (0.2–0.3 Cc.), a few whiffs of *chloroformum*, or the hypodermic injection of *morphinæ sulphas*.

To prevent the return of attacks, remove the cause if possible, and attention to the secretions and the internal administration of *potassii bromidum*, in doses sufficient to abolish the faucial reflex and produce the symptoms of bromism, have great power in diminishing the severity and frequency of the attacks; better results are sometimes obtained by the combination of the various bromides. Cases in which

the bromides are not serviceable are sometimes benefited by *argenti nitras*, *belladonna*, or *cannabis indica*, but such cases are rare. Weak and anæmic subjects usually do better with *strychnina* in full doses than with potassii bromidum. If a history of syphilis can be obtained, the combination of *potassii iodidum* and *potassii bromidum*, will effect a cure.

Whichever of the above remedies is beneficial in any particular case, the permanency of the relief can only be maintained by the continuation of the drug for at least two years after the last attack.

Gowers highly recommends the following in cases complicated with cardiac dilatation:

℞. Potassii bromidi, ...	gr. xx	1.3 Gm.
Tinct. digitalis, ...	♏x	.6 Cc.

Sig.—Three times a day, well diluted.

The following is the combination used in the insane wards of the Philadelphia Hospital:

℞. Sodii bromidi,		
Potassii bromidi, ... āā	℥iv	āā 16. Gm.
Liq. potassii arsenitis, ...	f℥iss	6. Cc.
Aquæ menthæ pip., ...	f℥iij	90. Cc.
Inf. gentian. comp., . q. s. ad	f℥viij	ad 240. Cc.

Sig.—Tablespoonful, diluted, three times daily.

Brown-Séquard's mixture for epilepsy is as follows:

℞. Potassii iodidi, ...	8 parts.
Potassii bromidi, ...	8 "
Ammonii bromidi, ...	4 "
Potassii bicarb., ...	5 "
Inf. columbo, ...	360 "

Sig.—One teaspoonful before meals, and three dessertspoonfuls on going to bed.

The following is an effective combination for the "mixed bromides":

℞. Sodii bromidi, ...	℥j	30. Gm.
Potassii bromidi, ...	℥vss	22. Gm.
Ammonii bromidi, ...	℈viij	10.6 Gm.
Potassii bicarb., ...	℥ij	8. Gm.
Inf. columbo, ...	f℥x	300. Cc.
Aq. chloroformi, . . q. s. ad	Oj	ad 480. Cc. M.

Sig.—Tablespoonful equals gr. xxx (2 Gm.).

Status epilepticus is always a dangerous condition, and efforts to prevent it should be made by active medication the moment a series or group of fits occur. The following combinations sometimes are wonderfully successful in aborting the status:

℞.	Chloral, ... gr. xxx	2. Gm.	
	Tinct. cannab. indicæ, ... ♏xv	1. Cc.	
	Infus. digitalis, ... f℥j	30. Cc.	M.

Sig.—By high enema, repeated if indicated in two or three hours.

Dr. Spratling, Craig Epileptic Colony, recommends:

℞.	Tinct. opii deodorat., ... ♏v	.3 Cc.	
	Potassii bromidi, ... gr. xxx	2. Gm.	
	Chloral, ... gr. xx	1.3 Gm.	
	Liq morph. (U. S.), ... ♏iss	.09 Cc.	
	Aquæ, ... f℥ss	15. Cc.	M.

Sig.—By mouth, or, if cannot swallow, by enema.

A hypodermic injection of *morphinæ sulphas*, gr. ⅓ (0.02 Gm.), and *atropinæ sulphas*, gr. $\frac{1}{60}$ (0.001 Gm.), has sometimes broken up a series of epileptic spasms.

The diet of the epileptic must be carefully regulated—meats, tea, and coffee excluded, or used in very moderate amounts. Forbid tobacco and alcohol.

Much enthusiasm is reported in the important results following trephining in cases of Jacksonian epilepsy. It is to be hoped success will follow this operation, but the subject is still *sub judice*.

"The surgical treatment of epilepsy has been extensively employed, but it is distinctly disappointing, for, while almost any operation may benefit a patient for a time, there is no operation which will certainly cure" (J. Chalmers Da Costa).

HYSTERIA.

Definition. A nutritional disorder of the nervous system, of the nature of which it is impossible to speak definitely; characterized by disturbances of the will, reason, imagination, and the emotions, as well as motor and sensory disturbances.

Causes. A morbid condition confined principally to women. Young girls, old maids, widows, and childless married women are the most frequent subjects of the disorder. The paroxysms frequently

develop during the menstrual epoch. The menopause is another frequent period for its manifestation. A peculiar condition of the nervous system, either inherited or acquired, is responsible for the phenomena of hysteria, the peculiar manifestations being excited by disturbances of either the sexual, digestive, circulatory, or nervous systems.

Hypochondriasis, a peculiar mental condition, characterized by inordinate attention on the part of the patient to some real or supposed bodily ailment or sensation. A continual introspection, as seen in males, is a condition much like the hysteria of the female.

Pathogeny. Structural alterations having thus far not been detected in cases of hysteria, it is classed as a functional disturbance of the nervous system. It should, however, be borne in mind that hysterical manifestations frequently develop during the prevalence of organic diseases.

Symptoms. These will be considered under the headings of the *hysterical paroxysm*, and the *hysterical state*.

The Hysterical Paroxysm or fit occurs nearly always in the presence of others, and develops gradually with *sighing*, *meaningless laughter*, causeless *moaning*, *nonsensical talking*, and *gesticulations*, or a condition of *fidgets* followed with a sensation of *choking*, *dyspnœa*, and a ball in the throat—the *globus hystericus*. These and similar symptoms precede the fit, during which the *unconsciousness is only apparent*, the patient being aware of what is transpiring about her. During the paroxysm the patients may struggle violently, throwing themselves about, their thumbs turned in and their hands clenched. Again, spasmodic movements occur, varying from slight twitching in the limbs to powerful general convulsive movements, and to almost tetanic spasms.

The paroxysm ends by sighing, laughing, crying, and yawning, and a sensation of exhaustion. During the attack it will be noted that the surface and face are normal, showing absence of respiratory embarrassment, the breathing varying from very quiet to spluttering and gurgling sounds, the pupils not dilated, the pulse normal, the temperature normal, and absence of foaming at the mouth and wounding of the tongue.

The Hysterical State is shown by disturbances of the *mental* and *sensory-motor* functions respectively. It may be a permanent condition or occur at intervals with greater or less severity.

Mental disturbances. The patients are emotional, erratic, excitable, impatient, and self-important, showing marked defects of will and mental power.

Sensory disturbances. This is either a condition of exaggerated sensibility or hyperæsthesia, as shown by the marked effects from the slightest irritation and the cutaneous tenderness along the spine, or a condition of anæsthesia, as shown by the apparent absence or recognition of pain after severe irritation, or a perverted sensibility, as shown by the feeling of tingling, numbness, and formication. Sensibility to heat or cold are often absent. There is great perversion of the special senses in many of the cases.

Charcot, referring to the ovarian hyperæsthesia of hysteria, says: "It is indicated by pain in the lower part of the abdomen, usually felt on one side, especially the left, but sometimes on both, and occupying the extreme limits of the hypogastric region. It may be extremely acute, the patient not tolerating the slightest touch; but in other cases pressure is necessary to bring it out. The ovary may be felt to be tumefied and enlarged. When the condition is unilateral, it may be accompanied with hemianæsthesia, paresis, or contracture on the same side as the ovarialgia; if it is bilateral, these phenomena also become bilateral. Pressure upon the ovary brings out certain sensations which constitute the *aura hysterica*, but firm and systematic compression has frequently a decisive effect upon the hysterical convulsive attack, the intensity of which it can diminish, and even the cessation of which it may sometimes determine, though it has no effect upon the permanent symptoms of hysteria."

Motor disturbances. These phenomena embrace every variety of motor disturbance, from exaggerated excitable movements to defective or complete loss of power. With the paralysis that may occur, neither nutrition nor sensation is constantly impaired. Hysterical paralysis is liable to frequent and sudden changes, the loss of power often disappearing suddenly. Hysterical contractures often are most extensive and persistent. Under some emotion or unknown cause a group or groups of muscles contract abruptly or by degrees, the spasms involving flexors or extensors or both with changes in reflexes, and lasting for days or years. Aphonia, from paralysis of the laryngeal muscles, is a frequent form of paresis. Some hysterical patients refuse to even make an attempt at speech (mutism).

"A curious enlargement of the abdomen is observed sometimes,

constituting the so-called *phantom tumor*. This region presents a symmetrical prominence in front, often of large size, with a constriction below the margin of the thorax and above the pubes. The enlargement is quite smooth and uniform, soft, very mobile as a whole from side to side, resonant, but variable on percussion, and not painful. Vaginal examination gives negative results, and under chloroform the prominence immediately subsides, returning again as the patient regains consciousness.

Among the numerous other symptoms that may develop in a hysterical patient are *disturbances of digestion, circulation, respiration, and disorders of micturition and menstruation.*

Among other phenomena that belong to the Hysterical State are to be mentioned *Hystero-epilepsy*, a condition of hysteria to which is superadded the convulsion, epileptic in form. *Catalepsy*, a condition in which the will seems to be cut off from certain muscles, and in whatever position the affected member is placed, it will so remain for an indefinite time. There may or may not be unconsciousness and loss of sensation. *Trance*, the individual lying as if dead, circulation and respiration having almost ceased. *Ecstasy*, a condition in which the individual pretends to see visions, and acts in a most ridiculous manner.

Diagnosis. The hysterical state is so general in its manifestations that it is to be borne in mind in diagnosing all ailments occurring in women. The diagnosis is attended with great difficulty, however, and requires the display of all the skill of the clinician to prevent error.

Prognosis. Death from either a hysterical fit or the hysterical state is the rarest of events, if it ever occur. The ultimate recovery of a hysterical patient is of frequent occurrence. Marriage has cured many cases, although it can hardly be advised by the physician.

Treatment. For the hysterical fit little need be done, as a rule, unless the paroxysm is violent or prolonged, in which case *ammonii valerianas*, *Hoffman's anodyne*, or *spiritus ammoniæ aromaticus*, may be administered. Charcot recommends the making of firm pressure over the ovarian region to check hysterical fits that are of a severe character.

The management of a confirmed case of hysteria will tax the skill of the most astute physician. It is in connection with hysteria that the peculiar phenomena supposed to arise from applying different metals to the surface of the body have been noticed.

Moral and hygienic measures are of the first importance in the management of hysterical patients. The treatment by *isolation* of hysterical patients is strongly urged by many specialists. Dr. S. Weir Mitchell has devised a plan for bedfast hysterical patients, of massage, faradization, and forced feeding, which has been successful in a number of cases.

There is no fixed therapeutical treatment for hysteria, the various symptoms calling for interference as they arise. It is well, however, to avoid the use of stimulants, opiates, chloral, and other nervous sedatives.

NEURASTHENIA.

Synonyms. Spinal irritation; nervous prostration; nervous exhaustion.

Definition. A debility of the nervous system, causing an inability or lessened desire to perform or attend to the various duties or occupations of the individual.

Prof. Bartholow describes it as consisting "essentially in an exaggerated susceptibility to bodily impressions and false reasoning thereon."

Causes. Heredity. It may result from various chronic diseases; mental worry or emotion; overwork, as "whenever the expenditure of nerve-force is greater than the daily income, physical bankruptcy sooner or later results" (Jackson). Neurotic temperament; sexual excesses; alcohol; tobacco.

Symptoms. Nervous debility may affect any organ of the body. It is a condition of nerve-tire or exhaustion, and hence the nervous energy necessary for functional activity of any particular organ may be wanting, a fair example being seen in cases of nervous dyspepsia.

One of the earliest manifestations of nervous exhaustion is an irritability or weakness of the mental faculties, as shown by inability to concentrate the thoughts, and efforts to do so causing headache, vertigo, restlessness, fear, a feeling of weariness and depression, together with the army of symptoms attendant on nervousness.

There may be ocular disturbances, cardiac palpitation, coldness of the hands and feet, chilliness followed by flashes of heat, followed in turn by slight sweating. Patients are troubled with insomnia, or fatiguing sleep, accompanied with unpleasant dreams.

In the male there are genito-urinary disorders, with pains in the back, giving the dread of impotence. In females, painful menstruation, ovarian irritation, and irritable uterus.

The "neurasthenic stigmata" are: Feeling of pressure on head; disturbance of sleep; pain in back; muscular weakness; dyspepsia; sexual disturbances and mental disturbances.

Diagnosis. It is of importance to determine between a true nervous exhaustion and nervous debility the result of organic disease. A study of the history of the case, together with the symptoms, should prevent error.

Neurasthenic symptoms in puberty are strongly indicative of mental instability, and great care must be exercised to prevent actual insanity from developing.

Prognosis. Usually some mental weakness remains after recovery from an attack of neurasthenia.

Treatment. The physician should remember that neurasthenia is not a disease *per se*, but that the victim is a sick individual needing the best environment, rest, and good food. Attention to the secretions, diet, and surroundings. *Rest* and diversion of the mind are essential to success. Travel, short of fatigue, pleasant companionship, and relief from responsibility. Bathing, massage, and galvanism are important aids in the management.

Among the internal remedies that are of value may be mentioned, *arsenicum*, *strychnina*, *ferrum*, *zinci valerianas*, *phosphorus*, *extractum cocæ fluidum*, *vinum cocæ*, and *syrupus hypophosphitis compositus*. *Quininæ sulphas*, in small doses, gr. i–ij (0.065–0.13 Gm.), daily, for weeks, seems to lessen the excitability of the nervous system.

The following is an excellent neurasthenic tonic:

℞.	Acid. phosphoric. dil., ...	f℥ ij		8. Cc.	
	Ext. cocæ fld., ...	f℥ vj		24. Cc.	
	Tinct. nucis vomicæ, ...	f℥ ij		8. Cc.	
	Syr. zingiberis, ...	f℥ iss		45. Cc.	
	Aquæ menthæ pip., ...	ad f℥ vj	ad	180. Cc.	M.

Sig.—Tablespoonful after meals, in water.

EXOPHTHALMIC GOITRE.

Synonyms. Graves' disease; Basedow's disease.

Definition. A disease of the nervous system; characterized by protrusion of the eyeballs, enlargement of the thyroid gland, dilatation of the arteries, and palpitation of the heart.

Causes. An undemonstrable condition of the nervous system, either inherited or acquired, is the predisposing cause of Graves' disease. Among the exciting causes are anæmia, shock, fright, chagrin, worry, and reverses of fortune.

It is more frequent in women than in men.

Pathological Anatomy. "Some structural alterations have been found, in a majority of cases, in the sympathetic ganglia, and especially in the inferior ganglia." (Bartholow.) The veins and arteries of the thyroid gland are dilated, the result of a vasomotor paralysis. The enlargement of the gland is the result of the dilated vessels, and a serous infiltration of its tissues, followed, if long continued, by hypertrophy. A considerable increase of fat behind the eyeballs has been observed. In the majority of cases more or less anæmia exists.

Symptoms. The development of the quarternary of symptoms may occur suddenly, the result of some great shock to the nervous system, but in the majority of instances the symptoms develop slowly and insidiously, with *cardiac palpitation*, with paroxysms of more marked acceleration, or tachycardia, the pulse-rate varying from 90 to 120, 150, and rarely as high as 200 beats per minute; soon *pulsations* of the vessels of the neck and thyroid gland may be felt and seen. The *enlargement of the thyroid gland*—the goitre—appears gradually after the development of the circulatory disturbances, although rarely it may be the first symptom observed. The goitre is elastic, rather soft, and has a *thrill* similar to an aneurism. The degree of enlargement varies in different cases, and in none ever attains a very great size. Following the development of the goitre occurs the *protrusion of the eyeball*,—the exophthalmos,—which may be confined to one eye, but usually occurs in both. Prominence of the eyeball may be the first symptom observed, but usually it does not develop until after the appearance of the goitre. The degree of protrusion varies from a slight staring expression to a point so great that the eyelids cannot

cover the balls. Associated with the protrusion of the eyeballs is inco-ordination in the movements of the eyelids and the eyeball, the sign of Graefe, so that when the eyes are quickly cast down, the eyelids do not follow them, the sclerotic being visible below the upper lid. Vision is unimpaired. Conjunctivitis may arise, the result of the imperfect protection of the protruding ball by the eyelids.

Associated with the pathognomonic symptoms are nervousness, irritability of temper, headache, insomnia, vertigo, fits of despondency, aphonia, and cough the result of pressure of the goitre, disorders of digestion, increase of temperature, anæmia, and loss of flesh.

Diagnosis. The fully developed disease presents no difficulties in diagnosis, but during its incipiency, before the characteristic symptoms have appeared, the disease may be confounded with such conditions as cardiac disease, neurasthenia, lithæmia, malaria, or incipient phthisis.

Prognosis. Recovery occurs in a fair number, but is slow and tedious. The disorders of the circulation lead to dilated heart in many cases, and ultimately death occurs from this cause. Relapses are frequent.

Treatment. One of the first injunctions to be placed on a case of exophthalmic goitre is *rest*, both physical and mental, as well as freedom from worry or emotional excitement; little progress will be made if this point be neglected. The general nervousness, restlessness, and insomnia will often call for special treatment, when use may be made of *chloral*, *potassii bromidum*, *sulphonal*, or *trional*. It is better, however, not to use this class of drugs in a routine manner, but for the special indications only.

The chief indication next to rest is the condition of the circulation. To control this, two remedies are of inestimable value; they are *digitalis* and *strophanthus*. The results I have seen from *tinctura strophanthus*, ♏v (0.3 Cc.), from three to six times daily, have been most satisfactory. Dr. Bartholow "has had good effects from quinina, belladonna, and ergotin in combination." I have had complete and quite rapid recovery in three pronounced cases from *dried extract of thyroid gland* in three-grain doses (0.2 Gm.) twice and thrice daily. Always begin the use of the preparations of thyroid gland with very small doses, gradually increasing as required. *Argenti nitras*, gr. ⅛ (0.008 Gm.), after meals, is often a valuable remedy, alternating with *strophanthus* or *digitalis*.

The associated anæmia is to be treated by *ferrum*, *arsenicum*, and an easily digestible and nutritious diet. *Galvanism* to the cervical sympathetic and pneumogastric is an important adjuvant to the medicinal treatment.

Surgical treatment has been strongly urged for the cure of exophthalmic goitre. DaCosta (J. Chalmers), after reviewing the literature of such operations, concludes: "Treat most cases medically and by rest; if medical treatment fails, consider the advisability of surgical treatment. Surgical treatment is not certainly curative, and is dangerous."

TETANY.

Synonyms. Tetanilla; intermittent tetanus.

Definition. A succession of tonic, usually bilateral, painful muscular spasms, occurring at irregular intervals, without loss of consciousness.

Causes. Unknown. Probably a special germ. It has been observed in those having a family history of nervous disorders.

Pathology. The disease is very rare in America, and no lesion has as yet been determined.

Symptoms. Tetany is the occurrence of *intermittent spasms* in the muscles of the arms, hands, legs, or feet, or, rarely, the face and larynx (laryngismus stridulus), associated with *pain* or "cramp."

The hands are thrown into a position such as they assume in writing, or such as is taken by the hand of a midwife; or the hand may be tightly closed, or one or more fingers may be cramped. The elbows and shoulders may be, at times, affected. In the feet the toes are drawn down and the instep upward, like in equinus. The knees may be cramped or the legs extended.

Any muscles may be involved. Trousseau pointed out that in those suffering from tetany, pressure upon the affected extremities at certain points will excite the spasms.

The *duration* of the spasm varies from a few moments to several hours, the *intervals* being from an hour to a day or more. A certain periodicity is noticed as to the hour of the day or night.

The electro-contractility is increased, as are also the reflexes. Erb first described the peculiar galvanic exaltation found in this disease.

The *consciousness* is always preserved, although the patients are very nervous.

Diagnosis. Tetanus and tetany may be confounded, and yet trismus is rare in the latter, and always present in the former.

Prognosis. Favorable.

Treatment. Attention to the secretions and excretions, and the use of *potassii bromidum*, gr. xx–xl (1.3–2.6 Gm.), well diluted, three times daily.

Gowers recommends *digitalis* for *nocturnal tetany*—those painful cramps in the calves in the early morning hours. *Urethan*, gr. x (0.6 Gm.), every three or four hours, is highly spoken of. Gray says: "Cold to the extremities and ice to the spine have an excellent effect."

TETANUS.

Synonyms. Lockjaw; trismus; cephalic tetanus.

Definition. An acute or subacute infectious disease, characterized by muscular rigidity, with paroxysms of tonic convulsions, the mind remaining clear.

Idiopathic tetanus when no open wound is discoverable.

Traumatic tetanus when an open wound is present.

Tetanus neonatorum when it attacks infants.

Lockjaw or *trismus* when the jaw alone is involved.

Cephalic tetanus when the throat and face are affected.

Causes. The result of a specific bacillus, which usually gains access to the system through an abrasion.

Pathological Anatomy. In the post-mortem examinations which have been made, no uniform morbid appearance was discovered on microscopical examination.

The brain, cord, lungs, and muscles are markedly congested, and show minute hemorrhages, such as are met with in all cases of death from convulsions, and which occur chiefly during the process of death.

In four post-mortem examinations of cases dying from tetanus at the Philadelphia Hospital, marked chronic nephritis was observed. Probably the future may show some connection between nephritis and tetanus, by which the specific poison is not eliminated as it might be were the kidneys normal.

Symptoms. The onset is rather sudden, with *stiffness of the jaw, neck, and tongue*, and some *difficulty in swallowing*, which increases

in extent, the stiffness passing down the spinal muscles to the legs, which are held in a firm *spasm*.

Gradually *tonic spasms* develop, which, involving the jaw muscles, cause "lockjaw"; the face muscles, "risus sardonicus"; neck and trunk muscles, "opisthotonos"; these tonic convulsions are associated with *intense pain*, and the patient suffers the greatest distress, particularly if the chest muscles are involved. Usually the febrile reaction is slight, but in many cases 102° F. to 104° F. is reached, and in some instances, as death approaches, 108° F. to 110° F. may occur, rising still higher after death. The mind remains clear till carbonic acid poisoning occurs. Usually a *wound*, not severe, can be found, the symptoms developing some two weeks after its occurrence.

The tonic spasms are developed by any sources of irritation, a draught of air, shaking of the bed or floor, suddenly opening the door of the room, the presence of a visitor, or attempts at speaking or movement.

Diagnosis. The symptoms are so characteristic, with the addition of a history of a wound, that an error seems hardly probable.

Tetany. The spasms chiefly affect the extremities, the muscles being free in the interval and trismus a late or very rare condition.

Strychnine poisoning often closely resembles tetanus, but there is no beginning trismus and more rapid development of the symptoms. No history.

Hydrophobia does not have trismus, but respiratory spasm, excited by attempts at swallowing, with increasing mental symptoms.

Prognosis. Unfavorable. The great majority die.

Treatment. Rest and quiet in a dark room. *Chloral, potassii bromidum, chloralamid, morphinæ sulphas*, and *paraldehyde* are each useful in cases, to hold in check or lessen the severity of the spasm for a time. Inhalations of *chloroformum* will control the spasms, and recoveries have been attributed to its use. *Physostigma* and *antipyrin* are recommended to remove the spasms.

Success has been reported in a number of cases from full doses, very early in the attack, of the *tetanus serum*.

Success is reported from *acidum carbolicum*, gr. iij (0.2 Gm.) a day, rapidly increasing until gr. vj–viij (0.4–0.5 Gm.) per day is reached, by the hypodermic method, a tolerance to the drug being noted in tetanus. Baccelli's method of using acidum carbolicum consists in the administration, hypodermically, of a two per cent. solution of the

acid at two or three hours' intervals. Other methods are to be continued in addition to the acid.

The nutrition must be maintained; often, on account of the stiffness of the masseters, rectal alimentation must be resorted to.

OCCUPATION NEUROSES.

Synonyms. Professional neuroses; artisans' cramp.

Varieties. Writers' cramp; piano-players' cramp; telegraphists' cramp; violin-players' cramp; dancers' cramp.

Definition. A group of affections of the nervous system, characterized by the occurrence of spasm (cramp) and pain in groups of muscles, in consequence of overuse or frequently-repeated muscular acts.

Cause. Undetermined. It has been noticed that many persons suffering from occupation neuroses have a family history of nervous affections.

Symptoms. The symptoms of any of the varieties named generally develop gradually and slowly, by a feeling of *stiffness* in the used member, the part feels fatigued and heavy, until it is impossible to use it, from the occurrence of *spasmodic contractions*. *Pain* on using the affected muscles, often associated with *tremor*, and in many cases with an actual *paralysis*.

Associated with the loss of power to follow the usual occupation is *nervousness*, *mental worry*, and often depression. There is often the sensation of prickling and numbness in the crippled member.

The electro-contractility is preserved until the atrophy of non-use develops.

Diagnosis. Calling to mind the history of the case and its results, in being limited to one member, the nature of the condition is evident.

Prognosis. Often unfavorable. Some recoveries are reported.

Treatment. Rest of the part and mental quiet, with tonics and other means to improve the general nutrition. *Faradism* in weak doses once or twice weekly seems useful. The following combination was of value in one case of writers' cramp and in a most aggravated case of ballet-dancers' cramp, each affecting the left limb:

℞. Zinci phosphidi, ... gr. ij .13 Gm.
Ext. nucis vomicæ, ... gr. x .6 Gm.
Ferri albuminat., ... gr. xxx 2. Gm.
Ft. pil. No. xxx.
Sig.—One after meals.

PARALYSIS AGITANS.

Synonyms. Shaking palsy; Parkinson's disease.

Definition. A nervous disease of unknown pathology, characterized by tremors, progressive loss of power in the affected muscles, moderate rigidity, with alterations in the gait, and at times mental changes.

Cause. Age seems to be an etiological factor, most cases developing after fifty years. Most frequent in women.

Pathological Anatomy. No characteristic lesion yet determined. It being a disease of past middle life, there is probably an interstitial hyperplasia of some layer of the cortex, from alterations in the intima of the vessels.

Symptoms. The onset is gradual, *the tremor* beginning in one of the extremities, oftenest the hand and forearm. At first it can be controlled by the will, for a time at least, and is suspended by voluntary movement. The disease gradually extends until an entire side or the upper or lower limbs are involved. The face and head rarely present tremors, but are not exempt. A peculiar *rigidity* of the affected muscles is characteristic of the advanced stage. "At this stage of the disease the hands are apt to assume the so-called bread-crumbling position, *i. e.*, the thumb and the fingers approximate and move restlessly over one another, as in the act of crumbling bread. There is often a tendency on the patient's part to go forward,—so-called propulsion,—and this is sometimes so marked that if the patient is once started in a walk forward, his gait becomes more and more rapid, and he cannot stop himself" (Gray). The patients are usually restless and annoyed with insomnia. The general health is fair. The mind is generally retained, although melancholia and mild dementia have been noted in a few cases.

Diagnosis. *Disseminated sclerosis* has a *tremor*, but only on voluntary movements—intention tremor. There is also scanning speech and ataxic gait, with mental enfeeblement, as shown by an unnatural contentment with the physical condition and surroundings.

Chorea is a tremor, but the movements are general, and particularly involving the muscles of the face. Again, chorea is a disease of children and young adults.

Prognosis. Radical cure not seen. Improvement often results from early treatment. The disease does not tend to shorten life.

Treatment. The patient should be placed at rest, bodily and mentally. Nutritious food, *oleum morrhuæ*, *hypophosphites*, and *arsenicum*.

Hyoscyaminæ sulphas, gr. $\frac{1}{30}$–$\frac{1}{10}$ (0.002–0.006 Gm.) three times daily, is a valuable remedy. Good results have followed the use of *hyoscinæ hydrobromas*, gr. $\frac{1}{200}$–$\frac{1}{100}$ (0.00032–0.00065 Gm.) three times daily. Mild *galvanism*, twice or three times a week, acts as a nervous stimulant.

MYXŒDEMA.

Definition. A progressive disease characterized by an infiltration of the connective tissue with a gelatinous substance, general failure of the health and mental failure, due to or associated with atrophy of the thyroid gland.

Cretinism is considered very akin to myxœdema, save that it is a congenital condition associated with alteration or absence of the thyroid gland.

Cachexia strumipriva, a condition following the extirpation of the thyroid gland, especially in the young, gives symptoms resembling myxœdema.

Causes. The cause of the atrophy of the thyroid gland is unknown. More frequent in women than in men. Usually develops about middle life. The disease is said to have followed the extirpation of the gland in the adult.

Morbid Anatomy. Atrophy of the thyroid gland, sometimes more advanced in one lobe than the other. "The pituitary body has been found increased in size" (Wood). Until the functions of the thyroid gland are more fully understood, the steps in the changes resulting from its atrophy can not be explained.

Symptoms. The disease develops slowly, often a number of years elapsing before all the characteristic phenomena are present. The face and neck, and often other parts of the body, have a bloated appearance. The normal wrinkles are obliterated, the nose is wide

and thick, the lips thick and everted, the mouth enlarged, as is the tongue, giving a coarse and broadened or mask-like appearance to the features. The skin is denser and does not pit on pressure, but is pale or chalk-like, or yellowish-white, with often a small reddish patch on either cheek. The expression of the countenance is immobile and stupid.

The hands and feet are enlarged, the skin is coarse and dry. The shape of the hands is changed, presenting a "spade-like" appearance.

The mental condition is sluggish and stupid, with loss of memory and of interest in the environments and affairs of life. Occasionally hallucinations of sight occur. The tendency is toward a dementia. Patients often complain of neuralgic pains and numbness and a sense of muscular weakness. The temperature is always below the normal. Anæmia develops, and often a subacute nephritis or a glycosuria or a terminal phthisis.

Diagnosis. Dropsy or a general œdema has a superficial likeness to myxœdema, but a study of the symptoms should prevent error, as *pitting* on pressure does not occur in myxœdema.

Prognosis. Under treatment a great improvement can be had, but whether a permanent cure results is not yet fully determined.

Treatment. Protect the surface by warm clothing. Warm bathing, followed by inunctions of olive oil, and a nutritious, easily assimilated diet.

For the disease, wonderful results have followed from the persistent use of *thyroid extract.* The dose must be carefully watched. Beginning with gr. ½ (0.03 Gm.) after meals, gradually increasing the amount until several grains a day are administered, and continued for a long time, unless symptoms of thyroidism occur, when the remedy must be discontinued for a time. The evidences of thyroidism are shown by great nervousness and restlessness, with shortness of breath, which becomes embarrassed upon exertion; rapid pulse with palpitation; confusion of mind, or even delirium, and insomnia and gastro-intestinal disorders.

For the anæmia and muscular weakness good results follow the use of *strychninæ arseniatis*, gr. $\frac{1}{60}$ (0.001 Gm.), combined with *ferrum.* Nuclein might be added to the treatment with advantage.

MENTAL DISEASES.

MELANCHOLIA.

Synonyms. Depression of spirits; psychalgia.

Definition. A variety of mental alienation, characterized by more or less profound *depression* of the emotions, with either no marked intellectual disturbance or the presence of more or less incoherence, and the association of hallucinations and delusions. The cerebral mechanism developing a condition of supersensitiveness, all impressions being exaggerated, and a state of abnormal self-consciousness existing.

Varieties. Melancholia simplex; melancholia hallucinatory; melancholia agitata; melancholia attonita; melancholia hypochondriacal; chronic melancholia; senile melancholia.

Causes. Hereditary predisposition. Failing health. Grief. Domestic and financial worries. Neurasthenia. Menstrual irregularities, pregnancy, childbirth, or lactation. Climacteric. Gastric and intestinal irregularities. Alcoholic and sexual excesses. Organic brain diseases. Religion rarely causes insanity, though it frequently gives color to it. Most frequent in women and in the young. Attacks of melancholia are more frequent in the spring and early summer months, and statistics also show that suicides are more frequent during this period.

Pathology. The alterations in the nerve structure, underlying an attack of melancholia, are undetermined. Anæmia and sluggish nervous energy are constant phenomena, but are hardly the only conditions disturbing the cortex.

Symptoms. Melancholia may be the initial stage of a mania, delusional insanity, or paretic dementia, or a stage of *folie circulaire*.

Mental: The cardinal condition is a feeling of *depression*, *misery*, or *mental anguish or pain*, for which no adequate cause may exist. The onset is usually gradual, with a disposition to neglect duties and self, the patient worrying over a something he cannot explain. The world is dark and gloomy, with a foreboding of some awful calamity

that is to affect or wreck the patient or his family. Suspicion, distrust, and, often, fear of wife, children, relatives, or friends. *Insomnia* is a constant and stubborn symptom. The memory is maintained, and the reasoning faculties are usually intact, except upon the painful sensations. The patient may sit quietly, declining or unable to talk (silent melancholia, or mutism), or be restless, according to the character of the emotions affected.

Physical: The patient presents either an anxious or a woe-begone expression. Headache, and particularly a post-cervical ache, is a very constant symptom. The skin is dry and harsh, the respirations superficial, the cardiac action slow and feeble; there is gastric catarrh, constipation, and scanty, high-colored urine. The tongue is flabby and coated, and the appetite is poor. The refusal to take food is most characteristic.

Hallucinatory melancholia is an aggravated form of the disease, where, in addition to the painful mental reflexes, are distressing hallucinations and illusions, the patient living in a realm of terror. The attack may be the result of a delusion, but much more frequently the depression and foreboding give rise to the delusion. The delusions of melancholia are usually of self-accusation, self-abasement, and justified persecution; the patient feels that he is being punished for some transgression, imaginary or otherwise.

The manias of persecution and the monomanias of suspicion are all of a melancholic type, the result of painful hallucinations.

Hypochondriacal melancholia shows all *subjective* impressions with disturbed memory, leading to the belief that the bowels have been removed, food cannot be digested, that the brain has turned around, that the blood cannot circulate, and that gallons of blood have been drawn from the body. These distressed individuals are often conscious of every organ of the body and experience disagreeable impressions coming from them all, and as a consequence are irritable, fretful, and exacting. It is to be remembered that not uncommonly these patients really have an organic disease giving a foundation for the delusions.

Melancholia agitata are those sad cases in continual agitation, in which the fearful and distressful thoughts and imaginations cause wringing of the hands, restless walking, rhythmic swaying of the body, and prayers beseeching help, with tears flowing down their cheeks, crying out for assistance and protection. Incoherence and violent

impulses are frequent, the excitement often resembling an attack of mania.

Melancholia attonita, or melancholia with stupor, the patients seeming to be overwhelmed, sitting mute, motionless, and expressionless, refusing to assist themselves in any way, and often requiring mechanical feeding. Memory is usually impaired in this variety; and attacks of violence may occur.

Chronic melancholia is the continuation of the depression over a long period, the individual living in the fear of impending danger or punishment for supposed acts for long periods of time, often with apparent lucid periods.

Senile melancholia is a condition of extreme mental distress associated with beginning senile dementia.

Suicidal impulses are present in a fair proportion of cases of melancholia, and unless there be everlasting vigilance the patient will succeed in his insane desire.

Diagnosis. The cases of simple melancholia are readily determined. Melancholia agitata is frequently mistaken for acute mania. Melancholia attonita closely resembles acute dementia—a condition, it is but fair to mention, denied by many alienists.

Prognosis. A typical attack of melancholia runs a definite course, not unlike the typical course of a fever. Favorable in the mild cases of all forms not associated with organic disease, and who have not reached the climacteric. Delusional melancholia has the most unfavorable prognosis. Pronounced cases of melancholia attonita are more apt to terminate in dementia than any other variety.

Treatment. Change of environment and rest are essential. Attention to the gastro-intestinal canal is of the greatest importance, as the dyspepsia and constipation of melancholic patients is a barrier to their recovery. Frequent bathing, with friction to the surface, aids in the eliminative action of the skin. The diet must be of the most nutritious character. If food be persistently refused, mechanical feeding must be practiced. The late Dr. Gray was a strong advocate of small doses of opium, or morphina, in acute melancholia, and in properly selected cases it is a most valuable agent. *Tincturæ quebracho*, ʒj–ij (4–8 Gm.), well diluted, three times daily, is often a valuable remedy. If the arterial tension is relaxed, good results follow the use of *digitalis*. *Sodii phosphas* is often useful.

Many cases of melancholia seem to be due to a brain fatigue, and

if the patient can be given many hours' sleep in the early days of the attack recovery is assured.

I have seen excellent results in melancholia attonita from *cannabis indicæ* in increasing doses.

Such tonics as *quininæ sulphas*, *arsenicum*, *ferrum*, *and strychninæ sulphas* or *arseniatis* are all of value in building up the patient. As the strength improves, open-air exercise must be added to the other means used.

Insomnia must be combated by evening bathing and feeding, and the use of *chloral*, *trional*, *sulphonal*, or *hyoscina* at bed-time.

MANIA.

Synonyms. Insanity; madness.

Definition. An intense mental exaltation, with great excitement, loss of self-control, with, at times, absolute incoherence of speech, and loss of consciousness and memory. (Clouston.)

Mania is a condition characterized by an abnormal exaltation and activity of the mental functions,—the intellectual faculties, the emotions, and the will,—and may show itself by irrational talking and acting, by delusions, illusions, and hallucinations, and by unusual muscular activity or movements. (Chapin.)

A mental condition in which there is an emotional exaltation, accompanied by illusions, hallucinations, delusions, great mental and physical excitement, and a complete loss of the inhibitory power of the will; in acute cases, and frequently in chronic forms of the disease, there is a marked destructiveness and a tendency to violence. (Wood.)

An attack of mania may be *acute*, *subacute*, or *chronic*.

Causes. Inflammation or other organic disease of the brain or its membranes. Mental shock or strain. Worry—domestic, moral, or financial. Excesses in alcohol, venery, or tobacco. Ovarian disease, or menstrual irregularities. Climacteric in those of nervous disposition. Pregnancy, parturition, or lactation. Nephritis. Anæmia. Syphilis. Hereditary predisposition.

Pathology. There are no constant morbid changes associated with mania. In all varieties of acute insanity there exists vitiated nervous energy or impaired vitality, the result of overexcitement or

overstimulation, motor disturbance, or auto-infection, the result of the imperfect elimination of the products of tissue waste. "There is no reason why a mere dynamical brain disturbance should not kill and leave no structural trace, any more than that it should for months abolish judgment, affection, and memory, and then pass off and leave the brain and all its functions intact." (Clouston.)

If death follow the acute symptoms, the vessels of the brain and membranes are engorged, but in the majority of instances the brain structure is normal.

If death occur in chronic mania, the most frequent change found will be a thickened and adherent dura mater. As observed, any form of organic change may be found *post-mortem* in those dying of any form of mania.

Symptoms. Acute Mania: The onset may be abrupt, or following a period of emotional depression, associated with lassitude, feeling of unrest, disinclination to work, and disorders of the gastro-intestinal canal, with insomnia and an *introspection;* these symptoms are termed the melancholic stage of mania.

The *maniacal stage* is characterized by loud talking, intense egotism, violent motions of the limbs and body, great restlessness, and excitement; the thoughts flow with wonderful freedom and amazing rapidity, the condition often resembling the symptoms of early alcoholic intoxication; as the exaltation continues the patient becomes either sullen, irritable, and angry, offering violence to those around him, or he becomes garrulous, talking of his personal affairs, is confidential and communicative to strangers, often making egotistic offers, passing frequently into incoherence of language and action. Sexual passions are frequently exalted, and acts of masturbation practiced, with outbreaks of vulgar, obscene, and profane language, which is entirely foreign to the individual in mental health. Delusions are an almost constant symptom, of a superficial or transitory character, changing with every new appearing mood. The maniacal patient is sleepless, or may have short naps, at once continuing his chatter on awakening.

Any attack may show all of the symptoms mentioned, or any one or more of them, but the great majority of cases show *intense egotism, loud talking, violent motion of limbs or body, hurry, excitement, insomnia, incoherence, and incessant noise.*

The course of an attack shows periods of remissions and exacerba-

tions, with nocturnal crises; loss of flesh and mental weakness are often marked as the attack progresses.

Acute delirious mania, typhomania, is a psychosis of sudden onset, attended with increased bodily temperature, dry tongue, quick, feeble pulse, scanty urine, and marked by delirium with sensuous hallucinations, marked incoherence, restlessness, refusal of food, loss of memory, and rapid bodily wasting, terminating frequently in death.

Amenorrhœal mania are attacks of mania occurring at the menstrual epoch. Homicidal, suicidal, and various hysterical impulses are frequent.

Mania-a-potu is an attack of acute delirium, due to alcoholic excesses in those engaged in a sudden debauch, or who have drunk heavily and eaten little, for a comparatively short period.

Asthenic mania, in which there is general anæmia associated with neurasthenic symptoms.

Dancing mania is a hysterical mental state in which, through sympathy and imitation, dancing of a most grotesque and extravagant character occurs. Usually epidemic.

Delusional mania is the result of fixed delusions, either causing or associated with the maniacal outbreak.

Erotic mania, erotomania, presents systematized delusions of an erotic character, not necessarily accompanied by animal sexual desire. *Nymphomania* is a morbid, irresistible impulse to satisfy the sexual appetite, and is peculiar to the female sex.

Epileptic mania follows an epileptic paroxysm, and is often of a most violent kind, the maniacal acts being of the most treacherous and malicious character.

Hallucinatory mania presents visual, auditory, olfactory, and other sense hallucinations.

Homicidal mania is any variety of mental disease in which there is a desire or an attempt on the part of the patient to commit murder. The condition may be the result of delusions that the persons attacked either are persecuting or going to kill the patient, or of the excessive excitement that vents itself in destructiveness, combativeness, or desire to kill, or there may be a morbid desire, impulse, or craving to do murder, or the homicidal act may be unconsciously done during an acute delirium, or a paretic or epileptic maniacal impulse. In cases of murder the question of responsibility or the difference between the *insane* criminal and the criminal is not always readily determined.

With insane criminals, in the *act itself* lies the satisfaction and not the object, while with criminals the *act* is only a means to an end; to the former crime is a pleasure, to the latter a paying business, necessitating, it may be, disagreeable or horrible acts.

Morphinomania is the insane craving for the stimulating action of morphia—a moral insanity.

Puerperal mania is the maniacal outbreak as seen in the puerperal woman. This is now thought to be of septic origin, although the mental strain through which the female has been passing is a predisposing factor in those who have a neurotic history.

Transitory mania, or ephemeral mania, is a rare form of maniacal excitement of sudden onset, violent and decided in character, accompanied by great insomnia, incoherence, and more or less complete unconsciousness of familiar surroundings. The attack as suddenly terminates, the duration being from a few hours to a few days.

Senile mania is the mental exaltation occurring in persons with senile arterial changes or senile cerebral atrophy. Soon followed by dementia.

Recurrent mania, or chronic mania with lucid intervals of longer or shorter duration. Generally of alcoholic origin.

A maniacal outbreak may present any one or a number of the varieties named.

Chronic Mania: A condition of *continual* mental exaltation, the acute symptoms having continued in a chronic course. The line that distinguishes between an acute and chronic mania must always be somewhat arbitrary and unscientific. The duration of the mania beyond twelve months is usually considered sufficient to determine the condition, and this is well, as it precludes the possibility of terming the condition incurable. If the term chronic mania was restricted to those cases in which, between the exacerbations of restlessness, excitement, and destructiveness, were evidences of dementia, less confusion would occur.

Terminations of Mania. About fifty per centum of acute manias, not due to organic disease, recover after periods varying from one month to several years. A fair proportion of cases make a partial recovery and are able to return to their work, but always showing some alteration in character or affection, or some eccentricity, or a slight mental weakness. About twenty per centum of cases terminate in dementia or mental death, and this is always the fear in each case.

Two per centum of cases die, either the result of exhaustion or from the organic condition causing or associated with the attack.

Prognosis. The question of recovery, partial or complete, is always difficult to determine, depending upon the cause, temperament, disposition, education, nationality, and the normal mentality of the individual. Recovery is usually gradual; rarely sudden restoration occurs.

Favorable indications are: sudden onset, short duration, youth of patient, absence of fixed delusions, good appetite, increasing hours of sleep; moderate or no increase in temperature, pulse, and respiration; no evidences of mental weakness, no paralysis or alteration of pupils or articulation, no epilepsy, no unconsciousness to the calls of nature, and no former attacks. Unfavorable indications are the opposite of these, and also the presence of organic brain disease, or a strong hereditary tendency, or the possession of an excitable disposition or nervous diathesis.

Treatment. The indications for treatment are to quiet the exalted mentality and to promote constructive metamorphosis. Every means should be used to lessen the excitement of the patient and produce refreshing sleep. A hot or warm bath is frequently one of the most soothing means of reducing excitement; changing the environment of the patient and placing him under the care of a good, firm, but kind and intelligent nurse is of importance; the society or visits of the family or friends must be forbidden, for visits act as stimulants to the disordered intellect and encourage discussion on the part of the patient as to the character of the treatment, and thus reduce the discipline so essential to early recovery.

If means of this character are unavailing, and, unfortunately, in the majority of attacks they will be, then resort must be had to sedatives, for every day's continuance of the maniacal outbreaks lessens the chances of restoration. Amongst the drugs having a distinct value are *hyoscinæ hydrobromas*, gr. $\frac{1}{200}$–$\frac{1}{60}$ (0.00032–0.001 Gm.), repeated two or three times daily, watching its effect on the pupils; *sulphonal*, gr. xx (1.3 Gm.), repeated with caution, watching its effect upon the heart and respiration; *chloralamidum*, gr. xxx–xl (2–2.6 Gm.), repeated three or four times daily; or, *trional*, gr. xxx (2 Gm.), repeated in two or four hours; this latter is one of the most reliable drugs for maniacal excitement and insomnia we now possess. I have seen excellent results from the use of *passiflora incarnata*, either as a tinctura, in

fʒj–fʒij (4–8 Cc.) doses, several times daily, or as extractum fluidum in smaller doses. Patients with much excitement and a weak pulse are benefited with full doses of the *bromides* and *digitalis*. If the muscular excitement is pronounced, good results follow *morphinæ sulphas*, hypodermically; it may be combined with either *atropinæ sulphas*, *hyoscinæ hydrobromas*, or *duboisinæ sulphas*.

In attacks of acute mania, with flushed face, throbbing arteries, full pulse, and delirious excitement, excellent results follow the use of *extractum gelsemii fluidum*, ♏ij (0.12 Cc.), every hour, until dilatation of the pupils and ptosis develop, unless improvement sooner occur; *tincturæ veratri viridis*, ♏ij–v (0.12–0.3 Cc.), is also useful. Post-epileptic excitement is best controlled with large doses of *chloral*, by the mouth or rectum. Ice or cold to the head is useful in cases with flushed face and throbbing temporals.

The general condition of the patient calls for the most prompt and efficient treatment. Attention to the gastro-intestinal canal and kidneys is of paramount importance, as many attacks of mania are the result of *auto-intoxication* from the retention of the products of malassimilation and tissue waste. The diet should be of the most nutritious character, administered at frequent intervals—peptonized or hot milk, hot broths, eggs, and often alcoholic or malt liquors.

Patients not infrequently refuse food on account of lack of appetite, abhorrence for food, or from fear of poisoning, when recourse must be had to the naso-stomachic tube, or nutritive enemata. If the breath be heavy, the tongue badly coated, the bowels costive, and the skin sallow, the very best results follow washing out the stomach, provided the maniacal condition permits.

Tonics are of great value, a combination like the following always being beneficial:

℞. Quininæ sulphat., ...	gr. xlviij	3.1	Gm.	
Strychninæ sulphat., ...	gr. ss	.032	Gm.	
Acid. hydrochlor. dil., ...	fʒ iij	12.	Cc.	
Aquæ chloroformi, ...	fʒ iij	90.	Cc.	
Aquæ menthæ pip., . . q. s. ad	fʒ vj	ad 180.	Cc.	M.

Sig.—Dessertspoonful, diluted, every four or six hours.

The question of removal to a hospital for the insane arises in nearly all cases, and should in my judgment be answered, in the vast majority of instances, in the affirmative, as the discipline, regular hours, and order of a well-managed hospital for the insane have a most remarkable effect on the majority of insane patients.

EPILEPTIC INSANITY.

Definition. A mental condition caused by or the result of epilepsy.

Causes. The careful study of the brain of those dying having epileptic insanity has failed to determine why some epileptics suffer from any of the insanities and others have their normal mentality, and another group are better after a convulsion.

I am familiar with ten cases of epilepsy who all seem much brighter, mentally, after their paroxysm, but in whom, after a drinking bout, each epileptic attack is followed by a wicked homicidal mania of many weeks' duration.

Varieties. Pre-epileptic mania; post-epileptic mania; dementia epileptica; imbecility with epilepsy.

Symptoms. The mental changes constituting epileptic insanity, save in the cases of epilepsy with imbecility or idiocy, develop after some years of the ordinary epileptic paroxysms.

Pre-epileptic mania has attacks of mania some days or hours preceding the epileptic convulsion. The patient is morose, irritable, and threatening, often making homicidal attacks on those around him, be they friends or foes. Rarely the epileptic seizure is replaced by various insane or so-called hysterical acts, as fits of dancing, laughing, crying, screaming, swearing, or scolding.

Post-epileptic mania follows the epileptic paroxysm, either taking the place of the comatose state or following it. The maniacal acts during these outbreaks are often of the most desperate and impulsive character, many an asylum physician and attendant carrying scars the result of attacks of post-epileptic maniacs.

Epileptic dementia is the terminal mental obliquity resulting in about thirty per centum of insane epileptics who do not succumb before to nephritis or tuberculosis.

Epileptic imbecility is a congenital condition in which epilepsy and imbecility are associated.

Prognosis. The great majority of persons suffering from epileptic insanity develop, sooner or later, either nephritis or tuberculosis.

Recovery from epileptic mania is a rare occurrence, although I am familiar with two cases. Thirty per centum of epileptic maniacs progress to dementia in from five to ten years.

Treatment. There is no doubt but that full doses of the *bromides* lessen the severity and frequency of the paroxysms. If the attack can be anticipated, it may sometimes be averted by an enema of *chloral*, gr. xx–xxx (1.3–2 Gm.), or *chloralamidum*, gr. xl–lx (2.6–4 Gm.), or *amyl nitris*, ♏v (0.3 Cc.), by inhalation or by stomach. For the condition of status epilepticus the following combination, alternated with saline purgatives, has given good results:

℞. Chloral, ... gr. xx 1.3 Gm.
Tinct. cannab. indicæ, ... ♏xv 1. Cc.
Inf. digitalis, ... f℥j 30. Cc. M.
Sig.—Administer as enemata every three or four hours.

The use of *opium* for a long period has broken up the recurrent maniacal attacks in several patients under my care.

The general condition of the patient must receive careful attention, as there is a strong tendency to the development of nephritis, tuberculosis, and gastric catarrh. This class of patients are great feeders—often gluttons—and are sure to eat more than they can properly assimilate. Free action of the bowels and kidneys must be promoted.

Never contradict, nor attempt to reason with, an epileptic during the period of excitement.

CIRCULAR INSANITY.

Synonym. Folie circulaire.

Definition. A mental disease characterized by regularly alternating and recurring periods of mental exaltation, depression, and semi-lucidity.

Causes. Hereditary predisposition. The exciting causes are any of those conditions which depress the brain or general system.

Pathology. There is no characteristic lesion associated with circular insanity.

Symptoms. Essentially a chronic condition and probably incurable. The disease usually begins as a *melancholia*, the depression being an apathy and torpor rather than a mental pain, and suicidal feelings and impulses are rare. This condition is soon succeeded by *mania*, a mental exaltation with hyperæsthesia and exaggeration of nervous functions, the reasoning power well retained; this is in turn followed by a *semi-lucid interval*, often giving promise of recovery, to be sooner or later followed by another cycle. These periods fol-

low each other with remarkable regularity, each being of the same duration. Rarely the various periods are of irregular duration.

The general health is well maintained, the patient gaining in flesh during the stages of depression and lucidity and losing during the period of exaltation.

Diagnosis. The regularity of the different periods soon establishes the diagnosis.

Prognosis. Incurable. Ending in dementia after a lapse of several years.

Treatment. Attention to the general health and meeting the symptoms of the different periods as they recur. No means known to prevent the recurrence of the periods.

KATATONIA.

Synonyms. Alternating insanity; Kahlbaum's insanity.

Definition. A mental disease characterized by irregular cyclical symptoms, ranging from melancholia to mania, followed by stupidity and confusion, with cataleptoid phenomena, followed by lucidity for a time, recovery, or passing to a dementia.

Causes. Hereditary predisposition. The exciting causes are usually the result of some excess. Rarely associated with organic brain disease.

Pathology. No characteristic lesions have been found associated with katatonia.

Symptoms. A typical case begins as a *melancholia*, the mental depression, uneasiness, and distress followed after a variable period by *mania*, associated with hallucinations and delusions. This period is followed in turn by a condition of *attonita*, or rigidity and immobility, or a *cataleptoid paroxysm*. Any of the stages may be followed by *confusional* symptoms, or a true dementia may develop. During the maniacal stage there is a tendency, in many cases, to histrionic and sermon-like declamation, or the speech may be of the *verbigeration* character—that noisy, incoherent, and meaningless speech seen in many manias, composed largely of the constant repetition of a few words or phrases without sense or sequence (onomatomania).

During the stage of attonita the presence of the so-called *mutism or mutacismus*, " a pathological tendency to be silent," may continue

for days, weeks, or months, or it may be interrupted by periods of verbigeration.

The immobility or rigidity so characteristic of a period of katatonia is frequently alternated with automatic, incessant, and monotonous movements—the stereotyped movements.

Patients suffering from katatonia often refuse food for days at a time and then suddenly present symptoms of boulimia. Vasomotor and trophic changes are frequent, one of the most constant being *cyanosis* of the hands and other peripheral parts. Hæmatoma auris, insane ear, or perichondritis auriculæ, is frequent. Epileptiform attacks may usher in the disease or occur during any of its stages.

Diagnosis. It may be diagnosed as melancholia, mania, or a dementia, depending upon which of the cycles be first observed, but after being under observation long enough to note a complete cycle the diagnosis is readily determined. Katatonia differs from circular insanity in the presence of the stage of attonita and catalepsy.

Prognosis. The disease may continue for a number of years and recovery follow, but as a rule the prognosis is unfavorable.

Treatment. Attention to the general condition, and combating the various symptoms as they arise. In cases associated with anæmia, *arsenicum* and *strychnina* seem to be valuable. Two cases were rapidly improved with small doses of *hyoscinæ hydrobromas*, gr. $\frac{1}{300}$–$\frac{1}{200}$ (0.00022-0.00032 Gm.) morning and evening. When food is refused by the insane, and stomachic or nasal tube or rectal feeding is necessary, the stage of food refusal is often wonderfully shortened by adding *sulphonal*, gr. x–xv (0.6–1 Gm.), to each feeding.

DELUSIONAL INSANITY.

Synonyms. Delusional mania ; delusional melancholia ; primary delusional insanity.

Definition. A mental state, with fixed or partly systematized delusions, associated with either brain exaltation or excitement *without* maniacal acts, or a mental depression, minus the somatic symptoms of melancholia.

An insane delusion is a false belief for which there is or may be no reasonable foundation and which would be incredible under the given circumstances to the same person if of sound mind, and concerning

which his mind is not open to permanent correction through evidence or argument.

"An insane delusion is a belief in something that would be incredible to sane people of the same class, education, or race as the person who expresses it, this resulting from diseased working of the brain convolutions."

Causes. Cerebral and bodily exhaustion the result of overwork, neglect of personal hygiene, or alcoholic, tobacco, drug, or sexual excesses—a neurasthenia. Impairment of the nervous centers, the result of fevers or shock. Climacteric period, worry, and insufficient food.

Pathology. Delusional insanity is a subacute or chronic condition; death seldom occurring, and when it does is the result of an intercurrent physical malady. In the few such cases in which post-mortem examinations have been made, the vessels of the brain were found torpid or dilated—a vasomotor paresis causing an imperfect cerebral circulation.

Symptoms. Either following an attack of acute mania or melancholia, but *more commonly* without either of these conditions, occurs a set *delusion* or *delusions*, which, to the patient, are so real that no amount of argument can dispel his or her belief. These cases are often classed as manias or melancholias, but, as they do not run the ordinary course of either of these conditions, they are best classed clinically by themselves. *The acuteness or subacuteness of the attack distinguishes them from paranoia.* Among the almost endless variety of delusions mention will be made of a few that have come under recent notice: A young man of twenty believes that he is President Cleveland; another patient, a driver, believed for ten months that he was the owner of a thousand horses, any one of which was worth thousands of dollars; he made a perfect recovery and now laughs at his old delusions. A young man of twenty-five believes his mother is not his mother, but the woman he boarded with, and that his brothers and sisters are her children but no relation to him. A young woman of thirty believes she is pregnant by a prominent merchant; the fact being she is not and never has been pregnant. The majority of the delusions are of an egotistical character, but lack the conduct or appearance of the position due to the character of the delusion. A patient with ragged clothing will assure you that he is worth millions, and yet sees nothing inconsistent between his delusion and his

personal appearance. Another will assure you of his vast business interests, and yet remains contented in the hospital wards, laboring faithfully in the kitchen or laundry. A woman assures you that she is the great Patti, receiving thousands of dollars for each operatic performance, and yet is apparently happy in the sewing-room.

An *hallucination* is an imperfect perception through any one of the senses. A person who imagines that he sees something, or hears something, or tastes something, or feels or smells something that he is not seeing, hearing, tasting, feeling, or smelling, has an hallucination.

Delusional insanity is often based upon the development of *hallucinations* of the special senses, that of hearing being the most frequent; patients hear "voices" telling them what to do or not to do, and a delusion is built up and developed. Again, "voices" upbraid them or charge them with various acts, and upon this is developed a persecutory delusion that causes them much unrest. The following case has lasted for five years, and while the patient is at times apprehensive of some evil that may result to her, and uses judgment to protect herself, yet is not, nor never has been, melancholic, or shown any evidences, other than her present belief, of mental failure. She enjoys fair health, and partakes of the world's pleasures. Six years ago her husband suddenly died and the settling of a large estate was thrown upon the patient. Sitting in her hotel at the window, about five years ago, she saw a man come to the window in a building opposite to where she was, and make some motion to her. She was greatly alarmed. That evening, while walking on one of the busiest streets of the city, she distinctly heard a young man, in passing, make an improper proposal to her, and she has never walked on that street since without the same thing occurring, although not always by the same person. Her daughter, who accompanied her, did not hear the proposal, nor has she ever heard it, although, I regret to say, is gradually becoming convinced it must be true. Now for the sequel: the woman is not depressed or worried, shows no evidences of melancholia, talks about the affair as if it were a fact, which it unfortunately appears to her, and avoids the unpleasantness by never again walking on the particular street nor going in that neighborhood.

Again, visions appear, which result in delusions of personal importance. Taste and smell may be perverted, causing prolonged fasting, often from fear of poisoning.

Diagnosis. Delusional mania and delusional melancholia are confounded with delusional insanity, the points of distinction being the absence of severe maniacal and melancholic acts; the patient simply possesses his insane delusion and may never refer to it unless questioned.

Paranoia or monomania and delusional insanity have many symptoms in common, but in the former "their whole thoughts and lives show a strong self-consciousness, and their egotism is intense" (Chapin); and if the patient believes he is Christ, he wishes to be so respected, and considers himself wronged if not so treated, while the delusional patient will say he is Christ and immediately drop the subject. There are, however, many border-land cases in which the diagnosis is difficult.

The distinction made here between paranoia and primary delusional insanity is not generally accepted.

Prognosis. In acute primary delusional insanity recovery is frequent, although the delusions may exist for a number of years. Many patients who make a complete recovery will still believe that their delusions were facts. A fair proportion of cases pass into the condition of chronic delusional insanity, this attack being the first or second period of Magnan's classification, viz.: *First period*, incubation or anxiety; *second period*, persecution; *third period*, grandeur, or ambition, or optimism; *fourth period*, dementia.

Treatment. A supporting plan of treatment, with thorough action upon the bowels, kidneys, and skin, and plenty of fresh air, is of great value in all cases of delusional insanity. If the disease is the result of excesses, a course of *strychnina* and *arsenicum* is indicated. A tranquil condition of the brain is essential, and few combinations are so valuable as *digitalis* and *hyoscina*, in small, repeated doses. Insomnia is an annoying symptom in many cases, and is best overcome by a digestible meal at bed-time, or a warm or hot bath in the evening, and if these fail a full dose of *somnal* [℞. Somnal, ʒiij (12 Cc.); glycerini, fʒss (16 Cc.); tinct. cardamom. comp., fʒss (16 Cc.); aquæ menthæ pip., ad fʒiij (90 Cc.). M. Sig.—Half-tablespoonful, repeated in two hours], well diluted, or *trional*, gr. xxx (2 Gm.), an hour before bed-time, in milk or spirits.

PARANOIA.

Synonyms. Monomania; chronic delusional insanity: reasoning mania; Verrücktheit.

Definition. A chronic mental disease characterized by fixed logical or systematized delusions of persecution, unseen or impossible agencies, or of self-exaltation, the emotions and memory being only paroxysmally defective, while, however, the life of the individual is dominated by the delusions.

The term paranoia is now commonly used to cover a group of insanities which are degenerative in origin, chronic in course, and characterized by systematized delusions, with little impairment of the emotional faculties, and is not generally accepted as a synonym for monomania.

"A primary developmental insanity." "A condition of degeneracy." "There is imbecility of mind and there are delusions" (Dewey).

Causes. There is generally a hereditary predisposition to insanity in monomania or paranoia. The exciting cause may be the result of an acute mania or melancholia, or the result of alcoholism, or the result of malnutrition in those who have had a struggle to keep their position in the world. Extreme worry in individuals with mental instability. Following primary or acute delusional insanity.

Symptoms. The course of monomania is essentially chronic, the delusions becoming perfectly fixed and unchanging upon one particular subject, or set of subjects, which in turn dominate the life of the individual. The most common characters of these systematized delusions are *delusions of persecution or suspicion, delusions of exaltation or of pride*, and *delusions of unseen agents or influences.*

A delusion of persecution is shown in a woman of average talents and education, who has devoted much time, thought, and worry to a number of worthless patents, and now that she is in an insane asylum believes she has been placed there that others may reap the rewards of her inventive genius; she is constantly annoyed by what the physicians, attendants, and patients are doing, claiming that many such acts are for the purpose of annoying or harming her, her suspicions being of the most aggravating character.

Delusion of exaltation or pride is well shown in the case of a man who believes he is Jesus Christ, and is angered almost to the point of

homicide if great consideration is not shown him. Another male, whose origin is from the lower walks, believes he is to marry a distinguished authoress, and will resent any doubt of his purpose with blows.

Delusion of unseen agencies is well shown in the case of a female, aged forty years, who labored under the delusion that she was beset by numerous devils in her abdomen, the real cause being the presence of a cancer of the liver. Patients complain of electrical influences, telephonic communications, and invisible agents tormenting them.

The range the delusions of monomania assume are most wide and varied, but always associated with the *ego*. The patient is being persecuted not because, as in melancholia, he has committed some sin, or thinks he has, and deserves punishment, but because the persecutors wish to deprive him of his rights, titles, or estate, or degrade him or in some way injure him.

Diagnosis. In the diagnosis of monomania there are three points to ever keep in mind: *first*, the duration—the fixed, systematized delusions must have existed over one year; *second*, the absence of symptoms of mania or melancholia; and *third*, the presence of systematized delusions affecting the personnel of the individual.

Prognosis. Monomania is an incurable disease. Unless tuberculosis develop within a few years, dementia results.

Treatment. Symptomatic, and all means that promote constructive metamorphosis.

GENERAL PARALYSIS.

Synonyms. General paresis; general paralysis of the insane; paresis; paretic dementia.

Definition. A subacute or chronic, degenerative disease of the brain, sometimes involving the spinal cord; characterized by *alterations* in the intellectual and moral character, with the development of unsystematized ideas of self-importance or delusions of grandeur, finally merging into dementia (preceded by either a mania or a melancholia), and the gradual development of tremor, slurring speech, pupillary changes, ataxia, trophic changes, and finally paresis.

Causes. General paralysis of the insane occurs chiefly between thirty and fifty-five years of age, and in the male more frequently than in the female, although a notable increase in the lower class of

females is being observed. It usually affects the robust, middle-aged individual, rapidly destroying all intelligence and judgment, leaving him to exist, often for months, as a demented human automaton.

General paresis is increasing, and some one has said its increase is in proportion to "syphilization and civilization."

Predisposing causes: Heredity; an ambitious overstraining for prominence, learning, or wealth; forced intellectual activity in those with imperfect or improper early training; or in those with an imperfectly developed or organized cortex; cranial injuries; atheroma.

Exciting causes: Alcoholic and sexual excesses; syphilis; mental and physical overstrain; worry. "In many cases I think the middle-aged general paralytic is suffering for the sins of his youth" (Clouston).

"General paralysis is not a penalty of high cerebral development, but the expression of a discrepancy—an inadequacy of some brains to sustain the strain to which the race, as a whole, is subjected" (Spitzka).

Pathological Anatomy. A condensed description of the pathological basis of general paralysis is difficult. It may be described as a chronic, diffuse, cortical encephalitis. The microscopical changes in the cortex, according to Mendel, as quoted by Folsom, are as follows:

1. Increase of nuclei and new cell formation, some nuclei small, some large, and with such varying reactions to coloring agents as to suggest dissimilarity of origin. The stellate or "spider" cells are increased in the upper layer of the cortex, where some may be normally found, and extend to lower layers, as is not the case in normal brains; they, too, may be several times the usual size and also push through the white substance to the ependyma of the ventricles. Proliferation of neuroglia or connective tissue, and in time sclerosis of the cortex, which involves the medullary substance also in a greater or less degree.

2. The larger blood-vessels may or may not be atheromatous; in the capillaries there is an increase of nuclei in the walls, with thickening and hyaloid degeneration.

3. In the nerve-cells, the ganglion-cells, granular and fatty degeneration of protoplasm, sclerosis, atrophy.

4. Atrophy and final disappearance of the nerve-fibers, not limited to the cortex and found in other brain diseases also—senile dementia and epilepsy, for instance.

5. Focal lesions of the most various kinds, and degenerative changes in the spinal cord, the several forms of sclerosis and myelitis.

The spinal cord undergoes atrophy with gray degeneration in posterior and postero-median columns, and of posterior spinal nerve-roots.

Symptoms. For clinical convenience the disease is divided into *three stages*—prodromal, maniacal, rarely melancholic, and the stage of dementia—although there is seldom a marked division between the stages.

Prodromal stage may exist unrecognized for months or longer. It begins by an *alteration* in the *habits* and *character* of the individual, such as spells of irritability and obstinacy, which will not admit of contradiction or opposition, and there is a general feeling of elation and *bien-être*, or egotism, shown by the exalted opinion of his own attainments and importance, and a great laudation of members of his family. He becomes boastful, untruthful, dishonest, and forgetful, neglecting engagements, business, self, and family. He frequently makes extravagant purchases and may waste large sums of money before his condition of irresponsibility is recognized, or may unwittingly resort to dishonest means to obtain money, as was shown in the case of an intelligent gentleman, who had squandered considerable money in unprofitable property, going to a railroad ticket-office, asking for a ticket, remarking he was without cash, writing a check for one hundred dollars on a bank he had never had an account with, receiving ninety-nine dollars in change, immediately going to a jewelry store and purchasing a lady's gold watch and chain, paying sixty dollars for the same, and then going to a pawnbroker's and pledging the watch and chain for forty dollars, and the following day going to the same ticket-office and buying another ticket, such as he had purchased with the fraudulent check, and on being arrested protested he had done nothing dishonest.

In many instances the patient develops ideas of an enterprising character, and resorts to all forms of expedients, which, to his mind, are going to improve his or his family's station and worldly condition. He determines to change his occupation or business, or attempts to instruct the authorities in what he conceives should be their duties.

The *moral lapses* of paretics are most frequent during this stage, consisting of acts of theft, drunkenness, violent impulses, or indecent

assaults, in individuals who have possessed a good moral character. They become profane and vulgar, and often resort to sexual excesses. Associated with any of the above symptoms may be any one or more of the following *physical* conditions: *tremor* of the muscles about the *mouth*, naso-labial folds, and of the *tongue*, causing a slight *slur or hesitating speech; alterations* in the *pupils*, or one pupil becoming somewhat larger than the other, or the pupils may be contracted to pin-head size with loss of accommodation; attacks of *vertigo*, or epileptiform or apoplectiform seizures. The gastric, intestinal, hepatic, and nephritic secretions are disturbed, and there may be headache and insomnia. After a variable duration, continuing in a mild degree for many months, is ushered in the—

Second or *maniacal stage*, which is much the same as a severe attack of acute mania (megalomania), *plus* the physical signs of paresis and the *delusions* or *ideas* of *grandeur*. The patient is excessively restless, boasting of his great wealth, intentions, prospects, and influence; one moment the most important of individuals, the next giving away thousands, and, if doubt is expressed as to his ability to do so, making it millions and often billions; presenting houses and lands, titles and offices, with unstinted liberality. It is to be noted that these so-called delusions of the paretic are in reality conceptions, or an expansive delirium, for when contradicted the patient makes no effort to defend them; they seem to be really *assertions* and *reassertions*, continuing until incoherency restrains the airy imagination. If questioned as to his health, replies, enthusiastically, "First-rate; never better in my life." The patient is *sleepless*, *noisy*, *destructive*, with attacks of blind, uncalculating *violence*, resisting all who attempt to restrain or molest him. The violent impulses of paretics are similar to the furious excitement of the post-epileptic maniac.

The *physical signs* are more pronounced: the characteristic *hesitating* and *slurring speech* increases; the *pupillary changes* become more marked; the tremor of the tongue and lips increasing and spreading to the upper extremities; the *gait ataxic;* the *patellar reflex increased*, or, rarely, diminished; the sphincter of the bladder disordered, and there sometimes occurs paralysis of the anal sphincters.

During the progress of the second stage are developed *cerebral crises,—syncope*, *petit or grand mal*, *apoplectiform* attacks, or *paralytic* seizures. Few cases but show one or more of these conditions. There also occurs myosis and loss of light reaction, and increased

wrist and elbow jerks. The maniacal stage is of shorter duration than any other, and is usually succeeded by the—

Stage of dementia, the patient presenting all the evidences of failing mentality, with *paralysis*, *trophic changes*, as shown by the occurrence of *bed-sores*, *cystitis*, *diarrhœa*, and *arthropathies*, or Charcot's joints, the patient emaciating rapidly, death closing the scene within a few months.

Rarely the maniacal stage is preceded or replaced by a condition of melancholia with expansive hypochondriacal delusions. In a few instances a genuine lucid interval has followed either the prodromal or maniacal stage. The *spinal form* of general paresis is fairly frequent, in which symptoms of spinal sclerosis are added to the mental ataxic phenomena of the usual form.

"Of the many divisions of general paralysis into several clinical types, all of them naturally more or less arbitrary, I know no other so satisfactory as Meynert's eight" (Folsom):

1. Simple progressive dementia, with the usual motor impairment which accompanies it, but, excepting hypochondriacal depression, not necessarily exhibiting other mental symptoms than dementia.

2. With the expansive delusions and the distinctive motor disturbances, which appear simultaneously and are progressive, constituting the "classic" form of general paralysis. The mental state is usually of self-satisfaction and exaltation, but there may be depression.

3. Of the same type as the last, but failing its steadily progressive character through arrest of the active process. The remissions, which seldom last so long as a year, raise hopes of recovery, but still manifest unmistakable impairment of the reasoning faculties. The psychic disturbances are much greater than can be accounted for by the atrophy of the brain alone.

4. Cases in which the characteristic exaltation and grand delusions reach such an astonishing height that manifest motor symptoms are looked for with confidence from day to day, and yet may not appear even for a year, any slight inco-ordination naturally being obscured by the general muscular disturbance. Meanwhile there may be such an improvement that the patient leaves the hospital for a while, once, rarely twice, on the responsibility of his family, but to return with marked motor as well as mental signs.

5. A very rare form, with alternate symptoms of exaltation and depression of the type of circular insanity.

6. With early furious delirium, painful hallucinations, confusion and incoherence somewhat resembling acute delirium

7. Progressive general paralysis, in which the characteristic indications appear secondary to other forms of insanity; for instance, after paranoia or melancholia, first described by Hoestermann.

8. The combined form with sclerosis in the whole cerebro-spinal tract, the symptoms of tabes or spastic paralysis predominating, according as the posterior or lateral columns of the spinal cord are chiefly involved. The ascending type, in which the cord is first affected, is rare. Optic neuritis, ending in atrophy and paralysis, especially of the ocular muscles, may precede marked mental symptoms.

Diagnosis. The development of the following symptoms removes all difficulties in diagnosis: *Mental*—alteration in character, loss of memory, defective will-power, changed moral sense, insomnia, violent impulses, melancholia or mania, unsystematized delusions of expansive character, with an exalted sense of well-being, gradually ending in dementia. *Physical*—hesitating, slurring speech; tremor of the lips, tongue, and upper extremities; pupillary changes, myosis, loss of light reaction; exaggerated wrist-, elbow-, and knee-jerk; attacks of syncope, vertigo, epileptiform or apoplectiform seizures, ataxia, trophic changes, and finally paralysis.

Paralytic insanity, organic dementia, or dementia paralytica, is not the same condition as general paralysis. It is the form of mental failure succeeding to gross brain lesions, such as apoplexy, tumors, softening, trauma, and sclerosis, associated with either hemiplegia or paraplegia.

Prognosis. Unfavorable. Remissions very, very rarely occur. The duration of general paresis has been considerably lengthened by the hospital care of such patients now in vogue in all properly conducted insane hospitals.

Treatment. The care of the general health and meeting symptoms as they arise is all that can be done for general paresis. It is claimed that if the condition be recognized early in the prodromal stage, the stage of cerebral congestion or vasomotor paresis, much good may be accomplished, and, if not cured, may be held in check for a long period of time by the use of such drugs as *digitalis* or *ergota*.

The maniacal excitement may be quieted by the use of the *hot bath*,

isolation (not seclusion), and the administration of small doses of *hyoscinæ hydrobromas*, which seems to exert an alterative action on the brain. For the insomnia, *trional*, gr. xx–xxx (1.3-2 Gm.), repeated, is usually satisfactory.

If a reliable syphilitic history is obtained, a thorough course of *hydrargyrum* and *iodides* should be administered. All means that promote the constructive metamorphosis are indicated in this most characteristic, progressive malady.

DEMENTIA.

Synonym. Acquired feeble-mindedness.

Definition. A progressive general weakening of the mind, characterized by a loss of reasoning capacity, a diminution of feeling, a weakened volitional and inhibitory power, failure of memory, associated with lack of the power of attention, interest, and curiosity, in varying degrees, in an individual who at one time possessed these mental qualities.

Forms. *Acute dementia; alcoholic dementia; dementia apoplectica or paralytica; dementia choreica; chronic or secondary dementia; dementia epileptica; organic dementia; partial dementia; primary dementia; dementia senilis; dementia syphilitica; dementia toxica.*

Causes. Deficient or feeble mental inheritance; age; atheroma; following mania, melancholia, paranoia, and other forms of insanity; the result of organic brain conditions; alcoholism; syphilis; developmental changes; climacteric.

Pathology. In *acute dementia* the changes are dynamic. In the *primary dementia* there is probably atrophy of certain cells from overstimulation, the tissues being normally deficient. In *secondary dementia* the chief changes are: "alteration in the size of the vessels, owing to thickening and distention, the thickening being most marked in the deep layers, and in the walls of the vessels are fatty granules and hæmatoidin. The perivascular canals are enlarged. The changes in the cells may be described as deficiency in the number of pyramidal cells, and a want of distinctness of outline and branches, the nuclei being larger, but changed in form, and only capable of slight carmine staining." In *senile dementia* there is general atrophy and degeneration of all the tissues of the brain.

Symptoms. The onset, extent, and variety of the impaired mentality differ greatly. In some patients the evidences of the failing mind are seen with the subsidence of the mania, melancholia, or other insanity, or soon after the development of the particular cause, while in another group of cases the development is slow and insidious. The difference in the intensity is marked; in one case the changes being scarcely noticeable, the patient being simply less active than before, showing a slight indifference to his environment; while in others the patients remain for hours alone, making no effort at movement and with little or no expression of the face; while another class of cases are oblivious to the demands for food or drink, or the calls of nature, existing "in the darkness of perpetual intellectual and moral night." Between these symptoms are all varieties and degrees of mental enfeeblement, the *physical symptoms* of dementia varying with the particular cases, many enjoying the best of health, eating and sleeping well; while others are always unwell, first one organ and then another being affected; while another group suffer from chronic diarrhœa, which finally causes death. Dementia patients seem predisposed to tuberculosis, nephritis, and epilepsy.

Acute dementia, or "stupor with dementia," is to be distinguished from "stupor with melancholia." The onset is rather sudden, with or without mania or melancholia, after some brain or bodily exhaustion, shock, or fright; the patient, a young person, "is horror-stricken, paralyzed in mind, not merely deranged, not depressed or excited, but deprived of feeling and intellect; his movements, if there be any, are automatic, but frequently he is motionless, standing or sitting, staring at vacancy for hours and days" (Blandford). These patients will not converse, and do not reply to questions, or but slowly, and in monosyllables, and their faces have a blank expression. One young man of twenty-three years, but three years in America, having an excellent musical education and remarkable skill as a piano performer, being unable to secure pupils to instruct, was obliged to accept a position as a piano-player at a questionable summer-resort garden, where he contracted the alcoholic and sexual habit. His excesses increased, although never intoxicated; he suddenly developed symptoms of dementia, his mind becoming a complete blank, his circulation feeble, the surface cold; and he never offered to enter the dining-room, and yet attended to the calls of nature. He never spoke, and would remain alone and motionless for hours.

The sweetest music caused no movement showing intelligence. He was placed on the Mitchell rest treatment for six weeks, and, as his bodily condition improved, he was daily taken to the piano, and his fingers made to touch the keys. For weeks he showed no interest, when, slowly, one day he feebly ran his fingers over the keys, and from that day improved, until, within four weeks, his performance on the piano attracted wide attention, and, after recovery, which was complete, with no recollection of this sickness, he secured pupils and is to-day a successful teacher. He has assured me that he suffered no pain, no depression, but that all is a blank to him.

Alcoholic dementia, the mental weakness resulting from excessive use of alcohol. *Inebriety* is a form of dementia, there existing an uncontrollable alcoholic habit, with weakened or absent *will* power and impaired mentality. Sutherland defines seven forms of insanity from alcoholic excess: (1) Intoxication; (2) delirium tremens; (3) mania-a-potu; (4) dipsomania; (5) mania of suspicion; (6) chronic alcoholism or dementia; (7) general paralysis.

Dementia apoplectica or *paralytica* is an organic or terminal dementia due to the cerebral changes sometimes following a severe apoplectic seizure, and is usually associated with hemiplegia.

Dementia choreica is a feeble-mindedness associated with chronic or hereditary chorea, or, in some cases, probably the result of chorea.

Chronic dementia is the designation applied to all forms of dementia that have existed after one or more years.

Dementia epileptica is the slow mental impairment resulting from long-continued and frequently occurring epileptic convulsions.

Organic dementia, the mental deterioration resulting from gross organic brain lesions, such as sclerosis, tumor, embolism, or trauma. An intelligent machinist, aged forty years, fell a distance of twenty feet, striking on his head, but not causing any determined fracture. He was unconscious one week, and on slowly recovering it was noticed that there was some change of character, which has grown most decided, and is associated with persistent insomnia. He is restless, indifferent; has loss of memory, is vulgar and profane, and inclined to be talkative—opposite traits to his former self; has violent outbreaks, and has a delusion that he is to make a fortune out of a polish the formula for which was given him by God, but which he has mislaid. He cannot read or write, or, at least, he will never make the attempt. His physical condition is good.

Partial dementia is an incomplete form of dementia in which the mental enfeeblement is associated with such a degree of intelligence and memory that the qualifying term "partial" is correct. This variety of dementia constitutes the majority of able-bodied, working, chronic insane patients seen in insane hospitals.

Primary dementia is seen most frequently in the young, developing slowly and insidiously, without any symptoms of mania or melancholia, usually in a youth who has given promise of a bright future, by a slowly progressive indifference to his former occupation, studies, or surroundings, with developing carelessness and negligence of person and proprieties, no amount of external stimulus serving to rouse the receding mentality, until finally the downward course ends in dementia so decided that, but for the history of the individual, the case would be classed as congenital, or imbecility.

Secondary, sequential, or chronic *dementia*, is the most common variety of mental impairment following mania, melancholia, and other insanities. According to Bevan Lewis, twenty per centum of manias and fifteen per centum of melancholias become permanent dements.

Dementia senilis, the result of cerebral atrophy, with its consequent failing mental power. Loss of memory for recent events is one of the most common symptoms. The disease often begins as a senile mania, melancholia, or delusional insanity. A female aged sixty years, with intemperate history, was, on admission, exceedingly filthy and with many vermin. She says she has been persecuted in her poverty; that she could not obtain goods from the store when she had no money, though the shopkeeper was rich; that she was neglected by others; insists that she ought to have been assisted; is unconcerned with her surroundings; is trifling and disrespectful, restless, moving her hands and body almost continually; is childish and silly in manner, frequently laughing, claiming she is happy, and will not work; cannot remember her only sister's name or where she herself last resided.

Dementia syphilitica is the feeble-mindedness resulting from cerebral syphilis. This group of patients are always sanguine, and assert they are "all right," "never sick in my life," and yet unable to assist or care for themselves. This form of dementia has many symptoms akin to general paresis, and, indeed, is often termed "pseudo-paresis."

Dementia toxica is the mental failure produced by the long-

continued and excessive use of opium, cocaine, and chloral. Chronic plumbism is also given as a cause.

Diagnosis. Acute dementia is often misnamed melancholia with stupor, but if the patient is in the teens the probabilities are that it is a case of the former, while if past forty it is almost certainly the latter.

The distinction between dementia and idiocy or imbecility must always be determined. Esquirol's graphic description is well worth remembering: "The dement *was* a rich man who has become poor; the idiot, on the contrary, has always been in a state of want and misery."

Prognosis. Acute dementia is generally favorable. All other varieties are incurable. The average life-time of dements is placed at about twelve years, the great majority dying of tuberculosis, nephritis, or apoplexy.

Treatment. Patients suffering from acute dementia should be placed on the Mitchell rest régime, with attention to all the secretions. If Dr. Mitchell's directions are carefully followed, the great majority of cases of acute dementia will recover within nine to twelve months.

For the other forms of dementia, unfortunately, there is no cure, the treatment resolving itself into attention to the general health, with proper custodial oversight.

DISEASES OF THE SKIN.

DISORDERS OF SECRETION.

SEBORRHŒA.

Synonyms. Acne sebacea; pityriasis; tinea furfuracea; dandruff.

Definition. A functional disorder of the sebaceous glands of the skin; characterized by an excessive or diminished and abnormal secretion of sebaceous matter, forming upon the skin either as an oily coating or in crusts and scales.

Varieties. *Seborrhœa oleosa; seborrhœa sicca.*

Causes. In newly born infants an increased secretion of sebaceous matter—the *vernix caseosa*—is a physiological process.

The origin of the disease is not fully understood, anæmia being a factor in many cases. Brunettes are more often affected than blondes, and women more frequently than men.

Pathology. Seborrhœa is a functional derangement of the sebaceous glands; if it be allowed to become very chronic, there occurs atrophy of the glands and follicles.

Symptoms. The affection may occur upon any portion of the body, its most frequent seat being, however, the *scalp* (*seborrhœa capitis* or *pityriasis capitis*), and next in frequency the *face* (*seborrhœa faciei*).

Seborrhœa oleosa appears as an *oily, greasy coating* upon the skin, without hyperæmia, and not attended with itching. The secretion is of an oily character, the quantity at times being so great as to collect in minute drops of a clear, yellowish fluid upon the surface.

The most common seat for this variety is the face—*seborrhœa faciei*—and nose—*seborrhœa nasi.*

Seborrhœa sicca consists in the formation of *dry*, more or less *greasy, masses of scales* or *crusts* of a *grayish, yellowish*, or *brownish-yellow color*, having a strong tendency to adhere to the skin, and attended with *decided itching.* Occurring upon the scalp—*seborrhœa capitis*—it is a frequent source of *premature baldness.*

Diagnosis. *Seborrhœa capitis* may be mistaken for dry eczema, but the former is always a *dry* disease, while in eczema moisture has occurred at some period of the affection. The scales in seborrhœa are very abundant and pale; in eczema the scales are scanty and reddish, the parts irritated, infiltrated, and thickened.

Seborrhœa sicca and *psoriasis* have many points of resemblance, whether occurring on the scalp or on the body. In seborrhœa the scales are minute or caked, grayish or yellowish in color, of an unctuous feel, and usually uniformly diffused. In psoriasis the scales are very dry, abundant, thick, white, irregularly dispersed, with intervening healthy skin, and the *surface beneath the scales is always reddish and inflamed.* The clinical histories of each are entirely different.

Prognosis. If properly treated, favorable, although the affection is obstinate to eradicate.

Treatment. The secretions require attention. If anæmia be present, *ferrum* and *arsenicum* are indicated. The following formula of Sir Erasmus Wilson, and lauded by Hebra, is valuable:

℞. Vini ferri, ... f℥iss 45. Cc.
Syr. simplicis,
Liq. potassii arsenit., . . . āā f℥ij āā 8. Cc.
Aquæ destil., ... f℥ij 60. Cc. M.
Sig.—Teaspoonful three times a day, well diluted.

Duhring recommends *calcii sulphidum*, gr. $\frac{1}{10}$–$\frac{1}{8}$ (0.0065–0.013 Gm.), several times daily.

Local measures are the most important in seborrhœa. For *seborrhœa capitis* the following plan will usually be successful:

The scales are to be thoroughly moistened with either *oleum olivæ*, *oleum morrhuæ*, or *adeps*, to facilitate their removal; it is best applied at night and the head covered with a flannel or other cap; or ℞. Liq. boro-glycerini, f℥ij (8 Cc.); Aquæ rosæ, f℥viij (240 Cc.); mix and apply on gauze. As soon as the crusts are well soaked they should be removed by washing with soap and warm water, or equal parts of soap, glycerine, and water, or the following will be found valuable:

℞. Tinct. sapo mollis, ... f℥iv 120. Cc.
Spts. vini rect., ... f℥ij 60. Cc. M.
Solve et filtra.
Sig.—Dilute and use as a soap-wash or shampoo.

The scalp is to be thoroughly cleansed of either of the above by again washing with warm water, and then dried by means of a soft towel. Then should be applied some oily or fatty substance, depending upon the condition of the scalp.

If much irritation, either *vaselinum* or *oleum amygdalæ expressum*. If no irritation be present, a stimulating preparation will be found of great benefit. Either of the following may be used:

℞. Tinct. cantharidis, ... f℥iij 12. Cc.
Tinct. capsici, ... f℥iij 12. Cc.
Ol. ricini, ... f℥ij 8. Cc.
Alcoholis, ... f℥ij 60. Cc.
Spt. rosmarini, ... f℥j 30. Cc. M.
—(*Duhring.*)

Or—

℞. Bismuthi subnitratis, ... ℥j 4. Gm.
Ung. hydrargyri ammoniat., . . ℥ij 8. Gm.
Ung. aquæ rosæ, ... ad ℥j ad 30. Gm. M.

The above should be repeated every day or two, as the symptoms may require, until a cure is effected.

The boroglyceridum mixture mentioned above or the following combination is useful for dandruff:

℞. Ammonii hydrochlorat., ... gr. x 0.65 Gm.
Glycerini, ... f℥j 30. Cc.
Aquæ rosæ, ... f℥v 155. Cc. M.
Sig.—Apply to head.

Seborrhœa occurring on other portions of the body is to be treated upon the same general principles.

COMEDO.

Synonyms. Acne punctata nigra; black-heads or worms.

Definition. A disorder of the sebaceous glands; characterized by retention in the excretory ducts of an inspissated secretion which is visible upon the surface as yellowish or whitish pin-point and pin-head-sized elevations, containing in their centres blackish points.

Causes. The exact etiology is unknown. Among the causes assigned are anæmia, menstrual disorders, urethral irritations, dyspepsia, and constipation.

Pathology. Comedo is an affection of the sebaceous glands and ducts, consisting of an accumulation of sebum and epithelial cells in the glands and follicles, dilating the ducts to such an extent as to produce the point or elevation upon the surface. The obstructed gland may relieve itself, or it may continue distending until a papule is formed. The duct sometimes contains small hairs, and also the microscopic mite, *demodex folliculorum*,—having a length of from $\frac{1}{150}$ to $\frac{1}{75}$ of an inch, and breadth of about $\frac{1}{500}$ of an inch,—which was at one time supposed to be the cause of the affection.

Symptoms. A chronic affection, observed for the most part on the face, neck, chest, and back. Each elevation or black-head or point is designated a *comedo*; if a number, *comedones*.

Each comedo is small, varying from a pin-point to a pin-head in size, having a brownish or blackish appearance, from the dust or dirt that has adhered to the unctuous surface. If they form in great numbers upon the face they are disfiguring, giving the individual the appearance of having had minute grains of powder implanted in the skin. There are no evidences of inflammation unless acne is associated, but, on the contrary, the skin has a dirty, greasy, unwashed appearance.

Diagnosis. There is no condition resembling comedo, so that its recognition is easy, unless complicated with acne; but even then the inflammatory appearance of acne should prevent error.

Prognosis. Favorable, although often remarkably obstinate.

Treatment. Derangement of any of the functions of the body should be corrected, and strict attention be given to the rules for promoting the general health.

Local measures are usually sufficient. The parts should be thoroughly softened by bathing with soap and warm water, when the comedones are removed by friction with a Turkish towel, pressure between the thumb-nails, the application of a watch-key, or the instrument known as the "comedo extractor," and their return prevented by an *unguentum* medicated, to meet the indications, with either *sulphur*, *alkalies*, or *hydrargyrum*.

Dr. Shoemaker recommends the following formula:

℞.	Thymol, ... gr. x	0.65	Gm.
	Acidi borici, ... ʒij	8.	Gm.
	Aquæ hamamel. Virg. dest., . . fʒiv	15.	Cc.
	Aquæ rosæ, ... fʒj	30.	Cc.

SIG.—Mop well over the surface once or twice daily.

MILIUM.

Synonyms. Grutum; tubercula miliaria or sebacea; acute punctata albida.

Definition. An accumulation of sebum in the sebaceous glands which are minus their excretory ducts; characterized by the formation of small, roundish, whitish, sebaceous, non-inflammatory elevations, situated immediately beneath the epidermis.

Cause. The origin of the affection is not understood.

Pathology. The sebaceous gland is distended with the sebum, which is unable to escape, owing to the obliteration of the duct, nor can the contents be squeezed out, as no sign of aperture is to be found, the formation being completely enclosed.

Rarely the retained secretion undergoes a metamorphosis into hard, calcareous, stone-like masses—sebaceous concretions or *cutaneous calculi*.

Symptoms. Milia may occur upon any portion of the body; their usual seat, however, is upon the face, forehead, and about the

eyes. They form gradually, are about the size of a millet seed, of a whitish, pearl, or yellowish color, hard, and of a rounded shape, giving the sensation to the touch of hard bodies embedded in the skin. They are not associated with inflammatory symptoms.

Diagnosis. Milium and comedo are somewhat similar in appearance; the differences are that in milium the sebaceous gland is distended without an opening, while in comedo the duct of the gland is always patulous upon the surface. Milium usually exists singly, the skin looking normal; while comedo is more general, the surface having a soiled and greasy appearance.

Prognosis. Favorable.

Treatment. As a rule, no treatment is needed, the number being few and their presence of no consequence.

If their removal be desirable, two modes suggest themselves: one, to open the cyst with a fine-bladed bistoury, and turning the contents out, destroying the remaining sack by the application of either *tinctura iodi* or *acidum chromici;* or the cyst may be destroyed by *electrolysis.*

SEBACEOUS CYST.

Synonyms. Wen; sebaceous tumor; encysted tumor.

Definition. A distention of the sebaceous gland and duct, with hypertrophy of the walls, forming a thick, tough sac or cyst: characterized by a firm or soft, more or less rounded tumor, having its seat in the skin or subcutaneous connective tissue.

Cause. Unknown.

Pathology. Hypertrophy of the gland and duct walls, the result of pressure from the accumulated contents, which consist of the altered products of the sebaceous secretion.

Symptoms. The development of wens is slow and insidious. The localities where they are most commonly developed are the scalp, face, back, and scrotum.

The tumors occur singly or in numbers, in size from a pea to a walnut, or larger, in shape either rounded, flattened, or semi-globular; in consistency they are either hard or soft and doughy; they are freely movable and painless.

Diagnosis. Sebaceous cysts may be confounded with fatty tumors.

Treatment. Excision and careful and thorough dissection of the cyst.

HYPERIDROSIS.

Synonyms. Hydrosis; ephidrosis; idrosis.

Definition. A disorder of the sweat glands, characterized by an increased secretion of sweat. The sweating may be either general or partial, but unilateral sweating, or hyperidrosis, is the condition here considered.

Causes. Often undetermined; occasionally inherited; diseases of the brain and disorders of the sympathetic nervous system.

Pathology. A functional derangement of the sudoriparous glands, over which the vasomotor system has control. The character of the secretion, chemically, may not differ from the normal.

Symptoms. *Hyperidrosis* may be acute or chronic, the amount slight or large, being constant or paroxysmal, the extent general or local, and it may or may not be symmetrical.

Bromidrosis is the designation when the secretion has an offensive odor.

Chromidrosis is the designation when the fluid poured forth is variously colored.

Uridrosis is the designation when the excretion from the sweat-glands contains the elements of the urine, and particularly urea.

Phosphoridrosis is the designation when the perspiration appears luminous in the dark.

Local hyperidrosis occurs most commonly upon the palms, soles, axillæ, and genitalia.

Hyperidrosis of the palms may be so profuse that the fluid accumulates and keeps the parts constantly macerated, the wearing of gloves being impossible, for as soon as the parts are wiped dry they are again bathed in the secretion. Jamieson states that hyperidrosis of the hands is very common in those who are daily excessive spirit drinkers.

Hyperidrosis of the soles is a disagreeable and often distressing condition, as the socks and shoes become saturated, and thus keep the soles constantly bathed, allowing the macerated epidermis to peel off, leaving a more tender skin exposed, causing pain and distress when walking. The maceration of the epidermis, the secretion about the toes, together with the moisture of the socks and the soles of the shoes, promote the rapid development of the *bacteria fœtidum;* all these together produce a most disagreeable, disgusting, and persistent odor, which is termed *bromidrosis pedum.*

Hyperidrosis of the genitalia attacks males more particularly, giving rise to a disagreeable, penetrating odor.

The sweating may be limited to one side—*unilateral hyperidrosis.*

Prognosis. The majority of cases are extremely intractable. Recovery, however, is the rule.

Treatment. The general condition of the patient must receive proper attention. *Atropinæ sulphas*, gr. $\frac{1}{120}$–$\frac{1}{60}$ (0.00054–0.001 Gm.) twice daily, is often serviceable. *Ergota* in pill or solution is useful. *Agaricina*, gr. $\frac{1}{6}$ (0.011 Gm.), has been recommended.

Local treatment is the most valuable, however.

The parts should be cleansed and immediately dried, and then dusted with some one of the numerous dusting powders. The following is a valuable powder:

℞. Acidi salicylici, ... gr. xx 1.3 Gm.
Zinci oleat., ... ℥j 30. Gm. M.

Perhaps the very best local application is *tinctura belladonnæ*, either diluted or full strength. *Aristol* as a dusting powder is very satisfactory.

In hyperidrosis of the palms and soles, the following are valuable, first washing the parts with a weak solution of *acidum carbolicum:*

℞. Acidi salicylici, ... ℥ss 2. Gm.
Cretæ præp., ... ℥j 30. Gm.
Aluminis exsic., ... ℥j 30. Gm.
M. et powder finely.
Sig.—Apply to parts with puff-ball.

Or—

℞. Acid. salicylici, ... 3 parts
Pulv. amyli, ... 10 parts
Pulv. soapstone, ... 87 parts. M.
Sig.—Sift into shoes and stockings.

Or—

℞. Sulphur. lotum., ... gr. xxx 2. Gm.
Pulv. arrowroot, ... ℥iv 15. Gm.
Acid. salicylici, ... gr. vij 0.45 Gm. M.
Sig.—Dust over feet and between toes.

Or—

℞. Potassii permanganat., ... gr. ij 0.13 Gm.
Aquæ destil., ... f℥j 30. Cc. M.

A saturated solution of *acidum boracicum*, alone or in powder, with equal parts of *acetanilidum*, applied frequently to the hands and feet, often proves curative.

For obstinate cases, involving the palms or soles, the following plan of treatment, as suggested by Hebra, will be found of the greatest service. It is imperative that the various steps be closely followed:

"The parts are to be cleansed with water and soap, and the following ointment applied on pieces of cloth cut to the size of the region. Lint smeared with the ointment is also to be placed between the toes or fingers, so that every portion of the skin may be covered with a layer of the ointment.

℞. Emplast. diachyli, ... ℥iv 120. Gm.
Olei olivæ, ... f℥iv 120. Cc.

The plaster to be melted and the oil added and stirred until a homogeneous mass results.

SIG.—To be used on cloths.

"The cloths are to be changed every twelve hours, when the parts are not to be washed, but rubbed with dry lint and starch dusting powder, after which new dressings are again to be applied in the same manner. This proceeding is to be continued from one to two weeks. When the disease is upon the soles, the patient may walk about in loose shoes." After a week or ten days the ointment may be discontinued, but the dusting powder is to be used for a considerable period. If relapses occur, the original treatment should again be instituted.

Painting the soles and under and between the toes with a ten per centum solution of *formalin*, morning, noon, and night, has given good results in a number of instances. A few drops of the solution may be put in the boot or shoe.

SUDAMINA.

Synonyms. Sudamen; miliaria crystallina (Hebra).

Definition. A non-inflammatory affection of the sweat-glands; characterized by the rapid development of millet-seed-sized, translucent, whitish vesicles in great numbers upon any portion of the body.

Causes. A high bodily temperature, causing unusual activity of the sudoriparous glands.

Pathology. The glands being excited beyond their capacity for

normal excretion, the excessive fluid, instead of escaping upon the surface, from some cause collects between the layers of the epidermis, in the form of minute, translucent pin-point-sized vesicles.

Symptoms. An ephemeral rash. Each minute vesicle is distinct, but they exist in great numbers, very closely resembling drops of free sweat. They develop rapidly, never coalesce, become puriform, or rupture. Fresh crops form from time to time. Their duration is transitory; the fluid is absorbed, the covering of each dries, forming a thin, delicate membrane, which disappears as a slight desquamation.

Treatment. The treatment is that of the disease with which they occur.

ANIDROSIS.

Definition. A functional disorder of the sweat-glands; characterized by a diminished or insufficient secretion of sweat.

Causes. The result of a congenital deficiency of the sweat glandular apparatus. Local anidrosis may result from injury to a nerve, during the course of chronic diseases of the skin, as ichthyosis, eczema, psoriasis, lepra, and elephantiasis arabum. In rare cases an individual ceases to sweat entirely at times; in such cases the general health is impaired, and during the hot season much suffering may result.

Treatment. Means to promote the activity of the skin and glands is the indication, such as the ingestion of large quantities of water, hot baths and steam baths, friction, and the use of sudorifics, the most valuable of which is *pilocarpus*.

HYPERÆMIAS OF THE SKIN.

ERYTHEMA SIMPLEX.

Definition. An acute affection of the skin, in which occurs an abnormal quantity of blood in the dermal vessels; characterized by discoloration, which disappears upon pressure and with more or less local increase of temperature.

Varieties. Idiopathic erythema; symptomatic erythema.

Causes. *Idiopathic erythema;* heat, cold, pressure, friction, or the contact of irritants, such as mustard, arnica, and dyestuffs.

Symptomatic erythema occurs most frequently in childhood, from diseases of the stomach and intestines; during the course of the various exanthemata.

Symptoms. A more or less rapidly developed *redness* of the skin, varying in color from pink or light red to dark red, which *disappears upon pressure*, to rapidly return again. The extent and form of the congestion varies according to the cause, at times being as small as a coin and isolated, and again diffused over a large area. The temperature of the congested part is slightly above the normal. Slight itching and burning are, usually, associated with the discoloration.

Diagnosis. Erythema resembles acute dermatitis in color, but the subjective symptoms of the latter are so decided that an error should not occur.

Treatment. Controlled by the cause, which should be removed, and the local application of some one of the various dusting powders.

ERYTHEMA INTERTRIGO.

Definition. An acute congestion of the skin, characterized by redness, heat, increased perspiration, and an abraded surface, with maceration of the epidermis.

Causes. In the fleshy, from contact or friction of opposing surfaces exposed to warmth—chafing. In children and infants, contact of moist clothing; also disorders of digestion.

Symptoms. Parts where the natural folds of the skin come in contact with one another, as the nates, perineum, groins, axillæ, and beneath the mammæ, in the fleshy and in infants, become *red*, *hot*, *painful*, and have an *increased* flow of *perspiration*, which in turn *softens the epidermis*, giving rise to an acrid, mucoid fluid. If not checked by the removal of the cause and the application of the dusting powders, inflammation—dermatitis—results.

Treatment. The congested parts should be thoroughly washed with water and Castile soap, or with bran-water, and carefully dried with a soft towel. The opposing folds of the skin are to be kept separated with lint or soft linen, the parts first covered with *cretæ præparata*, *zinci oxidum*, *bismuthi subnitras*, *amylum*, *lycopodium*, or *buckwheat-flour*.

INFLAMMATIONS OF THE SKIN.

ECZEMA.

Synonyms. Tetter; salt rheum; scall.

Definition. A non-contagious inflammation of the skin, characterized by any or all of the results of inflammation, at once or in succession, such as erythema, papules, vesicles or pustules, accompanied by more or less infiltration and itching, terminating in a serous discharge, with the formation of crusts, or in desquamation.

Forms. *Acute; chronic.*

Varieties. *Eczema erythematosum; eczema papulosum; eczema vesiculosum; eczema pustulosum; eczema rubrum; eczema squamosum; eczema fissum; eczema verrucosum; eczema sclerosum.*

Causes. Eczema attacks persons in all spheres—the rich, the poor, the infant or the aged, and males or females. Many families, especially those having the "catarrhal predisposition or peculiarity of constitution," seem more liable; indeed, it appears probable that a predisposition to eczema may be transmitted from parent to child. Among the causes suggested are: dentition, improper food, gastro-intestinal disorders, and imperfect elimination of products of waste; intestinal parasites, deficient urinary secretion, the rheumatic and gouty diatheses, vaccination, prolonged contact of hot fomentations, heat and cold, and contact with the poison vine (rhus toxicodendron) and poison tree (rhus venenata).

Pathology. Eczema is a catarrhal inflammation of the skin—a dermatitis, with superficial serous exudation. There is first *hyperæmia*, or congestion of the vessels of the skin—eczema erythematosum, when uniformly distributed, eczema papulosum, when the congestion is limited to distinct points. The hyperæmia is soon followed by a *serous exudation*. If the superficial exudation be profuse enough to form small drops, and if the epidermis possess sufficient resisting power not to give way immediately before it, vesicles form, producing the variety known as eczema vesiculosum; if the vesicles contain a large admixture of young cells, so that the serum be turbid, yellow, and purulent, the vesicles become pustules, termed eczema pustulosum; if the serous exudation be not sufficient to either elevate or break through the epidermis, instead of either vesicles or pustules forming, there occur dry scales, rising from the reddened skin—

eczema squamosum. When the exudation is sufficient to detach the epidermis, thus exposing the red and moist corium, it is termed eczema rubrum.

In chronic eczema the skin is subacutely inflamed; is very much thickened, hardened, and infiltrated with cells which extend throughout the entire corium, even into the subcutaneous connective tissue. The papillæ are enlarged and at times may be distinguished with the naked eye. Pigmentation may take place in the deep layers of the rete and in the corium, especially about the vessels.

Symptoms. Eczema is the most common of all cutaneous affections, with symptoms varying in accordance with the particular variety of the affection and the location, although the general characteristics of a catarrhal inflammation are present in all; these are *redness*, either limited or diffused; *heat*, of the part affected; *swelling*, the result of the serous exudation, giving rise either to a *discharge* (weeping), with subsequent *crusting*, or to the deposition of plastic material. The most constant, annoying, and troublesome symptom is the *itching*, or, at times, *burning*, which varies from that which is simply annoying to that which is almost unendurable.

Eczema runs its course either as an acute affection, lasting a few weeks, not to return, or to return acutely at wide intervals, or, as is much more frequently the case, it assumes a chronic state, continuing with more or less variations for months, years, or even a life-time. It may appear upon any portion of the body or involve the whole integument (*eczema universale*). The varieties are named in the order the lesions assume at their commencement.

Eczema Erythematosum. An *erythema* or *redness* of the surface, with a yellow tinge. The size of the macule may be very small or quite extensive, with irregular outlines. There may be slight swelling of the patch, but no discharge occurs unless it be where two surfaces come into contact (*eczema intertrigo*), as about the genitalia. Cases without discharge are covered after a few days with a thin film of dry, enfoliating epidermis or scale (*eczema squamosum*). When a discharge (weeping) or moisture occurs, it is followed with more or less crusting.

Intense itching is a constant symptom.

Eczema Papulosum, or Lichen Simplex. This variety of eczema appears in the form of small, rounded *papules*, the size of a pin-head, of *bright*-red or, at times, *dark*-red color; they may be either

discrete or confluent. In some cases all, while in others a greater or less number, of the papules pass into vesicles and run much the same course as vesicular eczema. The itching is of the *most intense* character, leading to severe scratching, by which the summits of the papules are torn, causing them to bleed, the blood forming dark-red crusts.

Eczema Vesiculosum. Begins with *burning*, *pain*, *redness*, and *swelling*, followed by an immense number of *minute vesicles*, either discrete or confluent, rapidly distending with a clear or yellowish fluid and attended with *intense itching*. Soon the vesicles rupture, the fluid rapidly diffusing over the surface and drying into *yellowish*, *honey-like crusts*. New crops of vesicles soon follow, or if subsequent vesications do not occur, the fluid rapidly diffuses over the excoriated surface, which also, in turn, dries into large, yellowish crusts. After a variable time the various symptoms gradually subside.

Itching is the most prominent subjective symptom, is intense, and gives rise to an irresistible desire to scratch.

All portions of the body are liable to this variety of eczema, the most frequent location, however, being the face, and when occurring in children is commonly known as *crusta lactea*.

Eczema Pustulosum, or Eczema Impetiginosum. This variety usually begins as vesicular eczema, the fluid rapidly changing to pus. After a short period, during which the pustules have increased in size, they burst and the escaped fluid forms thick, greenish-yellow crusts, which, in turn, rapidly dry and fall off, or crumble away.

The location of this variety is most usually upon the scalp and face. It is stubborn to treatment. *Itching* is a prominent symptom.

Eczema Rubrum, or Eczema Madidans. This is a variety only from a clinical standpoint. It may result from any of the foregoing varieties. The surface of the skin is inflamed and infiltrated, *red*, *moist*, and *weeping*, the profuse serum rapidly drying into thick, yellowish, greenish, or brownish *crusts*, the color depending upon the character of the fluid, which may be serum, pus, or blood from the exposed and lacerated corium. The crusts adhere closely and firmly to the part, and unless removed by mechanical means may remain indefinitely, the disease pursuing its course beneath. *Eczema rubrum*, or *madidans*, " then, presents two appearances—as it occurs with its crust, and as it exists without this covering. In the one case the skin itself is altogether obscured by a dirty, yellowish, or brownish

crust; in the other the skin presents a bright or violaceous red, punctate, wounded surface, deprived in great part of its epidermis, and exuding a scanty or profuse, clear or opaque, syrupy, yellowish fluid. Sometimes this is streaked with blood." The *itching* and *burning* are severe. It may develop upon any portion of the body, but is most commonly seen upon the legs, particularly in elderly people. Its course is chronic and increasing in severity.

Eczema Squamosum. This is also a clinical variety. It results from the erythematous, vesicular, pustular, or papular varieties of the affection, but more particularly the first named. A typical case presents itself in the form of variously sized and shaped reddish patches, which are dry, or more or less scaly, the skin being more or less infiltrated or thickened. Its course is usually chronic.

Eczema Fissum, or Rimosum. Another clinical variety. During the progress of the erythematous, vesicular, or pustular varieties of eczema, *cracks* or *fissures* result when the lesion occurs upon regions subject to constant motion, such as between the fingers, toes, nates, and the various joints. At times the fissures are extensive and deep, and of a bright-red color, showing the true skin, and intensely painful upon motion. Chapped hands are typical instances of fissured eczema.

Eczema Sclerosum. This variety of eczema, occurring most commonly on the palms, soles, and finger-tips, is characterized by hypertrophy of the papillæ, showing itself as hard, thickened, infiltrated, localized patches, which are most apt to crack (eczema fissum).

Eczema Verrucosum, or Papillomatosum, differs from the foregoing in that the thickened, infiltrated patch has a warty, verrucous appearance. Its course is chronic.

Eczema Acutum et Chronicum. The line which divides these two conditions is drawn by means of the clinical and pathological features. The course of eczema, in the majority of instances, is chronic. It may be said that so long as the general inflammatory symptoms are high and the secondary changes slight, the affection is acute, and that when the process has settled itself into a definite line of action, continually repeating itself and accompanied by secondary changes, it is chronic.

Diagnosis. The many varieties in which eczema manifests itself renders the diagnosis a matter of importance. The following characteristic features of eczema are of value in arriving at a diagnosis:

inflammation, swelling, and œdema, thickening from cell infiltration, *redness, the discharge of moisture*, followed by *crusting*, on removal of which a *moist surface* is presented, and *itching and burning*.

Erysipelas may be confounded with erythematous or vesicular eczema. The points of difference are the fever and other general disturbances. The deep-seated inflammation of the skin, rapidly spreading, with heat, swelling, and œdema without moisture, giving the surface a deep-red, shining, and tense appearance, are characteristics of erysipelas and very different from eczema.

Herpes and vesicular eczema bear some resemblance to each other; herpes zoster is distinguished by the neuralgic pains which are associated with it and are never associated with eczema. The other varieties of herpes occurring about the face and genitalia run their course in a few days, while eczema is of much longer duration and has a discharge followed by crusting.

Seborrhœa of the scalp and squamous eczema of the same region closely resemble each other. In eczema, however, the skin is more or less red, inflamed, and thickened, and the scales larger, less abundant and less greasy and drier than seborrhœa. In eczema the scales are usually seated upon a circumscribed patch, while in seborrhœa, as a rule, they cover the scalp uniformly. Itching occurs with both disorders. The history of the two affections should be of material aid in rendering the diagnosis clear; still, however, in many cases the diagnosis is difficult. Both are frequent affections.

Psoriasis should never be confounded with a typical case of eczema, but chronic eczema, with infiltrated, inflammatory, scaly patches, frequently looks very much like psoriasis.

Treatment. There is no specific. The indications are for the removal of the cause, where it can be ascertained, and attention to the general health. The diet should be of the most nutritious, but easily digestible, character. Fresh air and moderate exercise are also essential elements in the treatment, together with attention to the secretions, particularly of the kidneys. If the bowels be sluggish, much benefit follows the use of such laxative mineral-spring waters as the Hathorn, or Hunyadi Janos, or a morning dose of *magnesii sulphas*. For children, *syrupus rhei*, to which may be added *magnesia*; or, what is perhaps more efficient, a small dose of *hydrargyri chloridum mite*. If the urinary secretion be small and the urine heavy, use should be made of full doses of *potassii acetas*, and large draughts of

water. If either a rheumatic or gouty condition exist, *lithium* salts, to which may be added *vinum colchici seminis*. If a scrofulous tendency exist, use *oleum morrhuæ* and *syrupus ferri iodidi*. If anæmia, *ferrum*, *quinina*, *strychnina*, and the *mineral acids*, or *syrupus hypophosphitum compositus*, are indicated. If the disease shows a tendency to linger or relapse, *arsenicum* is a valuable agent, but is to be avoided in the acute condition. In the pustular variety *calcii sulphidum* is often useful in doses from gr. $\frac{1}{20}$ to $\frac{1}{4}$ (0.003–0.016 Gm.). Dr. Morrow strongly recommends the *Viola tricolor* (wild pansy), particularly for cases of eczema of the scalp, or *crusta lactea*.

Locally. The most important treatment for all the varieties of eczema is with local remedies, suiting the appropriate ones for each particular case, as no one combination is applicable for all varieties. It may be stated as a principle, that nothing irritant is ever to be applied to the surface in acute eczema, and that in the chronic form nothing can hardly be too stimulating. The too frequent washing or general baths are to be avoided, as they have a tendency to macerate the already softened epidermis. For cleansing purposes, in the majority of instances, ordinary Castile soap is sufficient.

Crusts and scales are nearly always present in eczema, and are to be removed before medicaments can be successfully applied. Their removal is to be secured by saturation with oily preparations, a starch or other mild poultice, or a saturated solution of *acidum boricum* or diluted *boroglyceridum*. After their removal the parts are to be cleansed with Castile soap and water.

For acute *erythematous* or *vesicular eczema*, use but little, or, what is better, no soap or water; instead, covering the parts with a dusting powder, one of the most useful being *acidum boricum*, or—

℞. Pulv. camphoræ, ...	ʒj	4. Gm.	
Zinci oleat., ...	ʒij	8. Gm.	
Pulv. amyli, ...	ʒj	30. Gm.	M.

Sig.—Dusting powder.

For acute *vesicular eczema*, Dr. J. C. White recommends bathing the affected part with *lotio nigra* (hydrargyri chlor. mite, gr. viij [0.5 Gm.], liquor calcis, fʒj [30 Cc.]), full strength, or diluted with equal parts of lime-water, applied by means of a sponge or a piece of cloth for ten or fifteen minutes at a time, and at intervals of a few hours or longer, the sediment being allowed to remain on the skin;

after which *unguentum zinci oxidum* is to be gently rubbed over the part. As a rule, the itching and burning are relieved at once, and the affection often arrested. Good results follow the application of a saturated solution of *acidum boricum.*

There are cases which do better from the application of ointments, of which the following is valuable:

℞.	Zinci oleat., ...	ʒiv	15. Gm.
	Olei olivæ, ...	fʒiv	15. Cc.
	M. et ft. unguentum.		

Or, *bismuth oleate*, made according to the following formula of Dr. McCall Anderson:

℞.	Bismuthi oxidi, ...	ʒj	4. Gm.	
	Acidi oleici, ...	ʒj	30. Gm.	
	Ceræ albæ, ...	ʒiij	12. Gm.	
	Vaselini, ...	ʒix	36. Gm.	
	Ol. rosæ, ...	♏ij	0.12 Cc.	M.

If the discharge be excessive, the following formula of Professor Bartholow is valuable:

℞.	Plumbi acetat., ...	ʒss	16. Gm.	
	Pulv. camphoræ, ...	gr. xv	1. Gm.	
	Ol. amygdal., ...	fʒij	60. Cc.	
	Cerat. flav., ...	ʒj	30. Gm.	M.

The late Dr. Frank Maury was partial to the following formula in vesicular eczema:

℞.	Hydrargyri chlor. mitis, ...	gr. xx	1.3 Gm.
	Ung. zinci oxid. benz., ...	ʒj	30. Gm.
	M. et ft. unguentum.		

For *eczema papulosum* the following lotions are particularly valuable:

℞.	Acidi carbolici, ...	ʒj–ij	4.–8. Gm.	
	Glycerini, ...	fʒiv	16. Cc.	
	Alcoholis, ...	fʒiv–vj	16.–24. Cc.	
	Aquæ destil., ...	ad Oj	ad 480. Cc.	M.

—Duhring.

Or—

℞.	Thymol, ...	gr. xv	1. Gm.	
	Alcoholis, ...	fʒj	30. Cc.	
	Aquæ destil., ...	fʒj	30. Cc.	M.

After the disappearance of the acute symptoms more stimulating applications are indicated, among which are *acidum carbolicum*, *thymol*, *pix liquida*, or *oleum cadinum*. It is to be remembered, however, that the more chronic the affection and the less the inflammatory symptoms, the more successful is *tar* in the treatment of eczema. I have seen excellent results from resinol ointment in nearly all varieties of eczema.

Dr. Duhring considers the following one of the most elegant of the tarry ointments:

℞. Olei cadini, ...	f℥ iss	6. Cc.	
Cerati simplicis, ...	℥ j	30. Gm.	
Ol. amygdal. amar., ...	gtt. x	0.6 Cc.	M.

Ft. ungt.

Or—

℞. Picis liquidæ, ...	f℥ j	4. Cc.	
Glycerini, ...	f℥ j	4. Cc.	
Alcoholis, ...	f℥ vj	24. Cc.	
Ol. amygdal. amar., ...	gtt. xv	1. Cc.	M.

Sig.—To be rubbed firmly into the skin.

The following is Dr. Bulkley's valuable "liquor picis alkalinus":

℞. Picis liquidæ, ...	f℥ ij	8. Cc.	
Potassæ causticæ, ...	℥ j	4. Gm.	
Aquæ destillatæ, ...	f℥ v	20. Cc.	

The potassa to be dissolved in water and gradually added to the tar with rubbing in a mortar.

Sig.—To be used diluted.

A very elegant preparation of tar is the French mixture known as "Goudron de Guyot."

For *eczema rubrum*, one of the most intractable varieties of the disease, especially the chronic eczema of the legs, the following mode of treatment, first suggested by Hebra, is the treatment *par excellence*. The accompanying instructions are to be adhered to. "A lump of the *sapo viridis* (made originally of herring-fat and potassa, and containing three per cent. of caustic potassa), the size of a small nut, is smeared upon a piece of wet flannel and applied to the affected part, and firmly rubbed until the soap has disappeared, when the flannel is to be dipped into warm water and again applied to the part and rubbed until an abundant lather forms, more water being added from time to time until the suds are most abundant, when the surface is

thoroughly washed and freed from all the soap and carefully dried, after which the following (Hebra's diachylon) ointment, having been spread before the application of the soap, is to be applied. It is prepared as follows:

"Fifteen ounces of the best olive oil are added to two pounds of water, and heated to boiling in the water-bath. Three ounces and six drachms of an equally good article of litharge (plumbi oxidum) are dusted over the fluid in ebullition, which is constantly stirred throughout, in order to prevent the formation of fatty acids. During the cooking, water is occasionally added as required. The stirring is to be continued until the ointment is quite cold.

"The ointment is spread upon strips of soft muslin and the affected part enveloped, care being exercised that neither folds nor wrinkles occur, the whole being covered by a firm roller and the patient being able to go about as usual. The entire operation is to be repeated twice daily."

A modification of the above ointment, technically known as "*unguentum diachyli albi of Hebra*," has been successful in my hands in a number of cases. The formula is—

℞. Emplast. plumbi,			
Vaselini, ...	āā ℥j	āā 30. Gm.	
Ol. lavandulæ, ...	q. s.	q. s.	M.

Dissolve with heat and stir till cold.

SIG.—Apply on strips.

Prof. Da Costa has used with success, in eczema rubra, *liquor arsenici et hydrargyri iodidi*, ♏ij–v (0.12–0.3 Cc.), after meals, and—

℞. Ung. plumbi subacet., ...	℥iv	16. Gm.	
Acid. carbolici cryst., ...	gr. iij	0.2 Gm.	
Ung. petrolei, ...	℥iv	16. Gm.	M.

SIG.—Apply freely on muslin strips.

An excellent formula for eczema of the vulva is—

℞. Iodoformi, ...	℥ss	2. Gm.	
Bal. Peruviani, ...	f℥j	4. Cc.	
Ung. petrolei, ...	℥j	30. Gm.	M.

SIG.—Apply on soft cloths.

TREATMENT OF SPECIAL FORMS AND VARIETIES OF ECZEMA.

Eczema capitis is either erythematous, vesicular, or pustular in character. If the first named, it at once tends to become chronic, settling into the variety known as *eczema squamosum*, often involving the entire scalp and accompanied with *intense itching*. The pustular variety is the more common form, occurring upon the scalp of children and young adults, existing as a few patches, or, what is more frequent, involving the entire scalp. The pustules soon rupture, the liquid drying into greenish-yellow crusts, often covering the whole scalp with a cap of crust. The hair becomes matted and caked, the sebaceous secretions collect, and if the part is not cleansed, becomes offensive. In severe cases of pustular eczema of the scalp enlargement of the lymphatic glands of the back of the neck and of those behind the ear occur; but they never suppurate. Pediculi are frequently associated with eczema capitis in children, either as a primary cause or a result of the matted condition of the hair constituting a favorable habitat for them.

Eczema capitis may be confounded with psoriasis, seborrhœa, syphilis, tinea favosa, and tinea tonsurans.

Treatment. If the *pustular* variety, removal of the crusts is the first indication. This is accomplished by saturating the scalp either with *oleum olivæ* or *oleum amygdalæ dulcis*, and then washing with warm water and soap, or the use of a starch poultice or a twenty-five per centum solution of *boroglyceridum;* after their removal the application of the following ointment, recommended by Professor Da Costa:

℞. Hydrargyri chlor. mitis, ...	gr. xx	1.3 Gm.	
Acid. carbol. cryst., ...	gr. iij	0.2 Gm.	
Ung. petrolei, ...	ʒj	30. Gm.	M.

Sig.—Thoroughly applied.

The late Prof. Ellerslie Wallace was fond of using the following:

℞. Sodii carbonatis, ...	gr. xxx	2. Gm.	
Ung. petrolei, ...	ʒj	30. Gm.	M.

Sig.—Apply thoroughly after removal of the crusts.

I have usually been successful with cleanliness, proper dietary, the internal use of *liquor arsenici et hydrargyri iodidi*, ♏ss–j (0.03–0.06 Cc.),

well diluted, after meals, and the local use of *acidum boricum*, or *unguentum zinci oxidum*, to which has been added a few drops of *acidum carbolicum*.

In cases associated with *pediculi* I have succeeded with the following, after the removal of the crusts:

℞. Hydrargyri ammoniat., ... gr. x–xx 0.65–1.3 Gm.
Adeps benzoat., ... ℥j 30. Gm. M.
SIG.—Thoroughly applied.

For the squamous variety of the scalp, the following formula, recommended by Dr. Duhring, is excellent:

℞. Picis liquidæ, ... f℥j 4. Cc.
Glycerini, ... f℥j 4. Cc.
Alcoholis, ... f℥vj 24. Cc.
Ol. amygdalæ amar., ... gtt. xv 1. Cc. M.
SIG.—Diluted or full strength, rubbed thoroughly into the scalp.

Eczema faciei. In this location the affection may be either acute or chronic. In adults the erythematous variety is frequently encountered in patches about the forehead and cheeks. Eczema of the face is more common in children, however, the varieties being the vesicular and pustular. It is seen on the forehead, nose, and upper lip, and is associated with *severe itching*.

Treatment. The same as eczema capitis, or the following:

℞. Zinci oleat., ... ℥j 4. Gm.
Ung. petrolei, ... ℥j 30. Gm. M.

Eczema labiorum. Eczema attacks the lips, either alone or in connection with other parts of the face. One or both lips may be affected. The symptoms are, swelling, redness, heat, infiltration, slight scaliness, and fissures. The affection may be in the skin around the border of the mouth, or the vermilion and mucous membrane of the lips. The mouth may be contracted and the lips partly glued together by the exudation and crusts.

Eczema labiorum may be confounded with herpes labialis and syphilis.

Treatment. Very difficult and discomforting to the patient. Among the remedies at times successful are: *Argenti nitras*, *potassæ nitras*, *acidum carbolicum*, *pix liquida*, and *collodium flexile*. I have succeeded in several cases with a powder composed of equal parts of *acidum boricum*, *acetanilidum*, and *bismuthum*.

Eczema palpebrarum. A frequent occurrence in scrofulous children, showing itself along the edges of the eyelids. Pustules involve the hair-follicles, followed by the usual crusting. The symptoms are swelling, redness, and itching, and unless the parts are frequently cleansed, the lids glue together. Conjunctivitis frequently complicates the affection.

Treatment. In mild cases success follows the use of *zinci oleatum* or *glyceritum acidi tannici.* In severe cases the plan recommended by McCall Anderson should be pursued. It consists in the extraction of the eyelashes and touching the edges of the lids with a solution of *potassa* in water, ten grains to the ounce. The edges should be carefully dried and the lid everted, a very small quantity on a delicate brush being applied, immediately neutralizing the alkali with acidum aceticum or vinegar.

Eczema barbæ. Eczema of the beard is characterized by the formation of extensive pustules, showing a preference for about the hairs, drying as yellowish or greenish crusts, matting the hairs together and adhering to the parts. The affection may be confined to the hairy portions of the face, or extend to other regions of the face, be localized or general, acute or chronic.

Eczema barbæ in general features somewhat resembles both tinea sycosis and sycosis non-parasitica, but sycosis is an inflammation of the hair-follicles only and is rarely associated with crusting, while crusting is abundant in eczema.

Treatment. Must be energetic and decided. The crusts are to be removed by poultices or warm water and soap. The part to be cautiously shaved; although quite painful the first time, it is hardly so afterward, and it is to be repeated every two or three days. After shaving, if the attack be acute, the same plan of medication as recommended by Hebra for eczema rubrum is to be practised, the application to be continuous both day and night, or only at night. If the attack be chronic, the following ointment should be applied after cleansing and shaving the beard:

℞. Hydrargyri ammoniat., ...	gr. xv–xxx	1.–2.	Gm.	
Sulphur. præcipitati, ...	ʒ ss–j	2.–4.	Gm.	
Ung. petrolei, ...	ʒ j	30.	Gm.	M.

SIG.—To be thoroughly applied.

In this variety of eczema I have seen marked benefit from the use

of *liquor arsenici et hydrargyri iodidi*, ♏ij–v (0.13–0.3 Cc.), three or four times daily.

Eczema aurium. Eczema of the ears may be either erythematous, vesicular, or pustular. If the former, thickening results, with desquamation of flakes or large scales; if either of the latter, crusts form, which may envelop the whole ear, the symptoms being swelling, redness, and severe burning and itching, and if the process extend into the meatus, occlusion may result, causing temporary deafness. The most characteristic symptom of erythematous eczema of the external auditory canal, besides the appearance of small flakes, is intense and persistent itching.

Treatment. For acute vesicular or pustular eczema, removal of the crusts and the use of *hydrargyri chloridum mite* as an ointment of the strength of thirty grains (two grams) to the ounce (thirty grams). If chronic, the use of *pix liquida*, as already suggested. For chronic erythematous eczema of the external auditory canal, the following formula has generally controlled this stubborn condition:

℞. Hydrargyri flav. oxid., ...	gr. j–iij	0.65–0.2	Gm.	
Morphinæ sulph., ...	gr. j	0.65	Gm.	
Vaselini, ...	ʒij	8.	Gm.	M.

Sig.—Apply to the canal.

Eczema genitalium. This is a most distressing condition. In the male the scrotum and penis are involved alone or together, the former alone being the more common, and is complicated with eczema of the inner side of the thigh or thighs. The symptoms are; swelling, often œdema, moisture, crusts, and painful fissures, followed by extensive thickening and accompanied with intense itching. In the female the affection attacks the labiæ, and, rarely, the vagina and mons veneris, and may extend to the surrounding parts, especially to the perineum. The symptoms of eczema of the labia are; great swelling, œdema, redness, with great heat and a free discharge, forming crusts, which are apt to glue the opposing surfaces together. If the variety be the erythematous, in place of a discharge with crusts, the symptoms named are followed by slight scales. The itching is most violent and distressing.

Treatment. The parts attacked should be kept constantly enveloped in cloths wet with a saturated solution of *acidum boricum* until the more pronounced inflammatory symptoms subside, when the

acidum boricum may be used as a dusting powder, completely enveloping the parts. Mild solutions of *menthol* are valuable. *Tinctura myrrhæ* or *hamamelis*, well diluted, are excellent applications. The following is an excellent application for tetter of the scrotum:

℞. Acidi borici, ... q. s. for sat. sol.
Tinct. myrrh., ... f℥ss 16. Cc.
Tinct. camphoræ, ... f℥ij 60. Cc.
Hydrarg chlor. cor., ... gr. iij 0.2 Gm.
Aquæ destil., ... q. s. ad f℥viij q. s. ad 240. Cc. M.
SIG.—Apply several times daily.

Ointments of *zinci oleatum* or *hydrargyri chloridum mite* are sometimes valuable. Persistent cases will often succumb to the plan of treatment suggested by Hebra for eczema rubrum. Resinol ointment is often successful.

Eczema ani. The anus may be attacked alone or associated with eczema of the perineum and genitalia. The symptoms are, redness, swelling, infiltration, and thickening, with or without fluid exudation. Fissures of the anus are usually present, and add to the distress of the patient, severe pain attending each stool. Persistent itching and burning, worse after retiring, add to the discomfort of the patient.

Pruritus ani may be mistaken for eczema ani. In the former the itching is only associated with such symptoms of inflammation as result from the irritation of scratching, while in the latter inflammatory symptoms precede the itching.

Treatment. The more acute symptoms are relieved by bathing the parts with a solution of *acidum boricum*, after which a weak application of *acidum carbolicum*, either as a lotion or ointment. Resinol ointment is invariably curative. The late Prof. S. D. Gross recommended the application of the following:

℞. Zinci oxidi, ... ℥vj 24. Gm.
Hydrargyri chlor. corrosiv., . . gr. j 0.65 Gm.
Glycerini, ... f℥ij 8. Cc. M.
SIG.—Apply thoroughly to affected parts.

Eczema intertrigo. Parts of the body that naturally come into contact with each other, as about the joints, the inner surfaces of the nates, in the groins, and beneath the mammæ, are frequently attacked with erythematous eczema, which is frequently, but erroneously, termed erythema intertrigo, or chafing. The symptoms are, redness,

heat, and a moist, macerated surface, aggravated by movement of the affected parts.

Treatment. The application of a solution of *acidum boricum*, or the use of dusting powders, such as *zinci oleatum*, *amylum*, or *hydrargyri chloridum mite*. It is essential for successful treatment that the opposing surfaces be separated by means of lint or gauze.

Eczema mammarum. The nipples, and more particularly those of primiparæ, are at times the seat of a vesicular eczema, with the formation of crusts and fissures, and unless speedily relieved, develop eczema rubrum. The pain on nursing becomes so severe that the mother is compelled to refuse the child. It must be borne in mind that eczema mammarum occurs in women who are not nursing and in single women.

Treatment. Dr. Tilbury Fox advises the following plan:

"1. Great cleanliness and care in washing away any remnants of milk after each time that the child is put to the breast; and if the nipple be tender and excoriated, use—

"2. A little liquor plumbi and calamine powder, as follows:

℞. Liq. plumbi, ...	f℥iss	6. Cc.	
Pulv. calaminæ præp., ...	℥iss	6. Gm.	
Glycerini, ...	f℥j	4. Cc.	
Adeps, ...	℥j	30. Gm.	M.

"3. I cover over the nipple with a lead nipple-shield. This excludes the air, keeps the part from being chafed, and I think the lead does good after the part has become less red and sore. I often use a little *glyceritum acidi tannici*, painted on night and morning.

"The above application can always be removed with a little cold cream and a little warm-water sponging before the child goes to the breast."

Eczema palmarum et plantarum. The features of the affection in both these regions are identical. The diagnosis is often obscured by the thickened state of the epidermis. The symptoms are, infiltration, thickening, callosity, moisture followed by dryness, and fissuring, the last named frequently becoming so deep and painful that the patient is unable to use his hands, or, if on the soles, to walk.

The affection is always chronic, affecting either of the parts alone, or all at one and the same time. Itching is a constant and annoying symptom.

The diagnosis is to be made between eczema of these parts and psoriasis or syphilis.

Treatment. The plan of Hebra for eczema rubrum will usually be successful for this variety. The following formula is also valuable:

℞. Hydrargyri oleat., 5–15 per cent., ʒiv 16. Gm.
Olei cadini, ... fʒss 2. Cc.
Cerat. simplicis, ... ʒiv 16. Gm. M.

Sig.—Rub well into part morning and night, first macerating with hot water.

Eczema unguium. The nails are seldom attacked alone, but in connection with eczema manuum. The symptoms are roughness, want of polish, unevenness, and a punctate or honeycomb appearance, similar to that seen in psoriasis of the nails. The nail becomes depressed, particularly at its root, thus interfering with its nutrition, resulting in loss of this appendage.

Treatment. Internally, *arsenicum* is a valuable remedy. Locally the following:

℞. Ung. picis liq., ... ʒiv 16. Gm.
Hydrargyri chlor. mitis, ... ʒss 2. Gm.
Vaselini, ... ʒiv 16. Gm. M.

Sig.—Apply thoroughly.

It is a remarkable clinical fact that very many cases of eczema, whether acute, subacute, or chronic, are rapidly cured by the use of *potassii iodidum* in variable doses continued for a long period.

URTICARIA.

Synonyms. Hives; nettle-rash.

Definition. An inflammation of the skin characterized by the development of *wheals* of a whitish, pinkish, or reddish color, accompanied by stinging, pricking, and tingling sensations, often associated with febrile and gastric symptoms.

Causes. Very frequently the result of sudden surface hyperæmia, or, rather, too rapid circulation through the superficial capillaries, the result of exposure to heat. Irritants and poison produce an attack when brought in contact with the skin. Gastric, intestinal, hepatic, nephritic, ovarian, uterine, and bladder derangements are very frequent causes. Certain medicaments; malaria; nervous disorders;

associated with purpura and rheumatism; pregnancy; lactation, and the menopause.

Pathology. An acute inflammation of the papillary layer of the skin, characterized by the rapid development of a "wheal"—a more or less firm elevation—consisting of a circumscribed collection of a semifluid material, the result of a rapid exudation into the upper layers of the skin. The production of the wheal is the immediate result of a disturbance of the vasomotor system, which is shown by the interference of the circulation in the wheal, the blood being driven from its centre to its periphery, causing the whitish apex and red areola so characteristic of the developed "hive."

Symptoms. An attack of "hives" is characterized by the sudden development of *wheals* upon the cutaneous surface, which usually as suddenly disappear, their site being temporarily marked by a spot of redness or hyperæmia.

With the appearance of the wheal occur distressing *itching*, *burning*, *tingling*, *crawling*, *pricking*, *and stinging sensations*, to relieve which the patient still further irritates, tears, or otherwise wounds the surface by scratching, whence are often developed deep-colored, flat, lenticular papules.

Very frequently an attack of "hives" is associated with *fever*, *headache*, and *gastric disorder*. The "wheals" may appear upon any portion of the body; their size varies from that of a pea to that of a walnut or an egg—the "giant wheals"; the number varying from a very few to being so numerous as to cover the whole surface. The shape, size, color, and number of the wheals that may occur have given rise to a number of names to designate the lesions. Thus, *urticaria annularis* occurs in rings; *urticaria figurata* occurs in spirals; *urticaria vesiculosa* has a vesicular development on the summit of the wheal; *urticaria bullosa*, a bullous development at the summit; *urticaria papulosa*, or *lichen urticatus*, the wheal and a small papule are combined; *urticaria tuberosa*, or giant wheals; *urticaria hemorrhagica*, or *purpurata urticaria*, a combination of urticaria and purpura; *urticaria evanida*, a rapid appearance and disappearance of the lesion; *urticaria perstans*, slow disappearance; *urticaria conferta*, when the wheals are confluent; *urticaria pigmentosa*, when the wheals are succeeded by pigmentations of the site, the tints varying from dark brown, greenish yellow, to a chocolate color; *urticaria febrilis*, when the wheals

are associated with fever; *urticaria ab ingestis*, when associated with indigestion.

Treatment. To prevent the recurrence of the disorder, a thorough investigation of the cause must be instituted.

Attention should be directed to the general health, the diet, and the secretions.

The following remedies, alone or variously combined, are often of benefit: *quinina*, *pilocarpus*, *atropina*, *tinctura belladonnæ*, *ammonii chloridum*, *arsenicum*, and *potassii bromidum*. *Sodii salicylas*, gr. iij–v (0.2–0.3 Gm.), every hour or two, followed by a thorough purgation, often acts like a specific. The following pill is valuable in many cases:

℞. Pulv. pilocarpi,
Ext. guaiaci, ... āā gr. iss āā 0.1 Gm.
Lithii benzoat., ... gr. iij 0.2 Gm. M.
SIG.—Two to four each twenty-four hours.

If there be atonic dyspepsia and constipation, the following combination is useful:

℞. Magnesii sulphat., ... ℥j 30. Gm.
Ferri sulphat., ... gr. xvj 1. Gm.
Sodii chloridi, ... ℥ss 2. Gm.
Acidi sulphurici dil., ... f℥ij 8. Cc.
Infus. cascarillæ, ... f℥iv 120. Cc. M.
SIG.—Tablespoonful before breakfast, diluted.

Local measures are of the greatest value, either as baths, lotions, or dusting powders. The following are among the most serviceable: sponging with *alcohol*, *brandy*, *whiskey*, *vinegar and water*, *witch-hazel*, *salt water*, *alkaline baths*, and *acid baths*. Duhring recommends the following:

℞. Acidi carbolici, ... ℥iss 6. Gm.
Glycerini, ... f℥ij 8. Cc.
Alcoholis, ... f℥viij 240. Cc.
Aq. amygdal. amar., ... f℥viij 240. Cc. M.
SIG.—Use as a lotion two or three times daily.

Bulkley suggests the following:

℞. Chloralis,
Camphoræ, ... āā ℥j āā 4. Gm.
Misce, and rub and incorporate with
Pulveris amyli, ... ℥j–ij 30.–60. Gm.
Misce, and keep tightly corked in a wide-mouthed bottle.
SIG.—Rub in with hand.

A serviceable formula is the following:

℞. Chloroformi, ... f℥j 4. Cc.
Ung. zinci oxid., ... ℥ij 60. Gm. M.
Sig.—Apply to wheals.

HERPES.

Definition. An acute inflammation of the skin, characterized by the development of one or more groups of *vesicles*, filled with a clear serum, occurring for the most part about the face (*herpes facialis*) and genitalia (*herpes progenitalis*).

Causes. *Herpes facialis;* during the course of febrile and nervous disorders; associated with digestive disorders and colds.

Herpes progenitalis; the origin is local, from uncleanliness or friction.

Pathology. Hebra defines the various forms of herpes as "a series of acute cutaneous diseases of cyclical course, marked by an exudation which collects in drops under the epidermis and elevates it, forming vesicles which are never solitary, but always appear in groups."

Symptoms. The appearance of the vesicles is usually preceded by a feeling of heat in the region, together with slight tumefaction or swelling. Rarely the herpetic attack is attended with malaise and pyrexia.

The eruption usually appears in the form of a small cluster of pinhead to split-pea sized vesicles, containing a clear fluid, becoming cloudy, afterward puriform, and drying in small, yellowish or brownish crusts; they are few in number, and may coalesce. They disappear without leaving a scar.

Herpes facialis; occur upon any portion of the face, but most frequently about the lips—*herpes labialis*. The alæ of the nose, auricles, and the mucous membranes of the mouth and tongue are frequent locations, in the latter appearing as excoriated patches from rupture of the vesicles.

Herpes progenitalis; in the male the chief site is the prepuce (*herpes præputialis*). In the female they are comparatively rare; but when occurring, it is upon the labiæ majora and minora and the skin about the vulva.

This variety is preceded by burning, itching, or neuralgic pains, accompanied by redness, congestion, and more or less œdema.

The lesion about the genitalia is likely to be mistaken for one form or other of venereal disease.

Herpes gestationis; a rare affection of the skin occurring during pregnancy, consisting of erythema, papules, vesicles, and bullæ, attended with intense burning and itching. It may appear at any time of pregnancy up to the seventh month, and continues until some time after delivery.

Treatment. *Herpes facialis* seldom calls for treatment, although in marked cases of *herpes labialis* protection with *liquor gutta-percha* or *collodium flexile* promotes desiccation.

Herpes progenitalis; cleanliness is of the first importance. Coating the eruption with the medicaments mentioned above, or washing with a saturated solution of *acidum boricum*, and afterward dusting with *hydrargyri chloridum mite*, are useful. In recurring cases of herpes of the vulva, *arsenicum* is a specific (Jonathan Hutchinson).

The parts may be rendered less sensitive in frequently recurring cases by astringent lotions, as *acidum tannicum* or *zinci sulphas*. Circumcision, when required, may be practised.

HERPES ZOSTER.

Synonyms. Zono; shingles; a girdle; intercostal neuralgia.

Definition. An acute, inflammatory disease; characterized by the development of groups of firm and distended vesicles situated upon inflamed bases corresponding to a definite nerve trunk, and accompanied by more or less severe neuralgic pains.

Causes. The eruption and consequent neuralgic pains are the immediate result of an inflammation of the ganglia or of the nerve trunks and branches,—*a neuritis*,—probably of the trophic fibers of the affected part; but the cause producing this condition is obscure. Among the many that have been suggested are: cold, injuries to nerves, anæmia, malaria, and the medicinal use of arsenicum.

Pathology. An inflammation of either the ganglia, the nerve trunk, or branches—probably the trophic system—causing the development of vesicles in the lower strata of the rete with "the infiltration of serum and inflammatory cells" of the papillæ and corium.

Symptoms. Begins with *neuralgic pains*, either of a burning or lightning-like character, with slight febrile phenomena, followed by the appearance of *papulo-vesicles along the tract of pain;* these soon become *vesicles* situated on bright-red, highly inflamed bases. The vesicles are about the size of pin-heads, or, perhaps, a little larger; usually discrete, although they frequently coalesce, forming irregular patches, coming in groups until the third to the fifth or even tenth day, when they gradually desiccate, and at the end of the second week nothing remains but a slight scar, which may disappear or become permanent.

When the eruption is at its height, it is perfect in its anatomical formation, each vesicle being well shaped and seated on a bright-red, inflamed patch of skin, and distended with a translucent, yellowish fluid.

The eruption is almost invariably confined to one side (unilateral) of the body, although in rare instances it is seen upon both (bilateral) sides. It is usually found upon well-known nerve tracts. According to the region affected it is termed *zoster capitis*, *zoster frontalis*, *zoster faciei*, *zoster ophthalmicus*, *zoster auricularis*, *zoster nuchæ*, *zoster brachialis*, *zoster pectoralis*, *zoster abdominalis*, *zoster femoralis*.

Diagnosis. The lesions of shingles are usually so well marked that an error in diagnosis should not occur. The neuralgic pain preceding the eruption and its development in distinct groups upon inflamed bases following a nerve tract are so different from the simple herpes of the face or genitalia, or from the lesion of eczema.

Prognosis. Favorable. The affection is self-limited, the duration being about two weeks. It is said that "zoster of the orbital region may seriously involve the eye and prove fatal."

Treatment. The affection is self-limited. The indications are to relieve the pain and protect the vesicles from irritation. The following combination diminishes the pain and modifies the duration:

℞. Zinci phosphidi,
Ext. nucis vomicæ, ... āā gr. x āā 0.6 Gm. M.
Ft. pil. No. xxx.
Sig.—One every two to four hours. (Bulkley.)

Prof. Bartholow "has seen excellent results in cases of shingles from galvanization of the affected intercostal nerves—the positive pole being placed over the point of emergence of the nerves, and the negative brushed over the terminal filaments of the skin."

The general symptoms are to be treated as indicated. Anæmia or depression are benefited by full doses of *ferri et quininæ citras*.

For the pain no remedy seems comparable with the hypodermic use of *morphinæ sulphas*, gr. ⅛–⅓ (0.008–0.022 Gm.), with *atropinæ sulphas*, gr. $\frac{1}{100}$ (0.00065 Gm.), near the lesion. *Antipyrin*, gr. xv (1 Gm.), repeated every three or four hours, or *phenacetin*, gr. v (0.3 Gm.), every three or four hours, relieves the pain in many cases. *Sodii salicylas* gr. x–xv (0.6–1 Gm.) every few hours is recommended.

Locally, relief follows coating the "shingles" with either *collodium flexile* or *liquor gutta perchæ*, to which *morphinæ sulphas* may be added. *Aristol* dusted over the lesions, or *acidum boricum*, as a powder, or combined with *lanolin*, is useful.

MILIARIA.

Synonyms. Lichen tropicus; miliaria rubra; miliaria alba; prickly heat.

Definition. An acute inflammation of the sweat glands; characterized by the development of discrete, whitish or reddish, pin-point and millet-seed-sized papules, vesicles, or vesiculo-papules, productive of prickling, tingling, and burning sensations of a most aggravated character, associated with more or less malaise.

Causes. Excessive heat, the result of excessive or tightly-fitting clothing, or a high external temperature. Most frequent in fleshy adults who perspire freely, and in children. Nervous prostration; severe dyspepsia and general debility seem to predispose to "prickly heat."

Varieties. *Miliaria papulosa; miliaria vesiculosa.*

Pathology. The pathology of the two varieties is the same—both inflammatory affections of the sweat glands; in the one papules, in the other vesicles, develop about the orifices of the excretory ducts.

In either variety occurs hyperæmia of the vascular plexus of the sweat glands, followed by slight exudation about the ducts, giving rise to the minute papules or vesicles, which remain until the cause has been modified or removed, when they are rapidly absorbed.

Symptoms. *Miliaria papulosa*, known as lichen tropicus and "prickly heat," is of sudden onset, with the occurrence of numerous minute, acuminated *bright-red papules*, about the size of a pin-head

or millet-seed, and but slightly raised above the level of the skin. The papules are preceded by and accompanied with *sweating* (hyperidrosis) and *distressing tingling*, *pricking*, and *burning sensations*. If the attack be severe, *vesico-papules* and *vesicles* are freely interspersed among the numerous papules. Rarely the secretion of sweat is notably diminished.

Miliaria vesiculosa; in this variety, instead of papules, immense numbers of *vesicles* develop, of the size of pin-points and pin-heads, of a whitish (*miliaria alba*) or yellowish-white color. The surface from which they arise is of a bright-red color, owing to each vesicle being surrounded by an *areola* (*miliaria rubra*). The vesicles are preceded and accompanied with *sweating* (hyperidrosis) and most *distressing tingling*, *pricking*, and *burning sensations*.

Either variety may attack all parts of the body, but the abdomen, chest, back, neck, and arms are the regions usually invaded.

Duration. This varies with the cause. It may appear, fully develop, and disappear in a few hours. In those predisposed it may continue more or less marked throughout the entire summer.

Diagnosis. If the cause, nature, and seat of the affection are taken into consideration, no error should occur.

Eczema papulosum has a resemblance to "prickly heat," but the course of eczema is slow, and the papules are larger, more elevated, and firmer than those of miliaria papulosa.

Eczema vesiculosum and miliaria vesiculosa are to be differentiated by the marked differences in the progress of each,—the former slow, the latter rapid; the vesicles of the former rupturing spontaneously, those of the latter only when severely irritated.

Sudamen is not an inflammatory affection, while miliaria is.

Prognosis. The affection is often most rebellious in fleshy persons and children, and if neglected, it passes into eczema or an erythematous intertrigo.

Treatment. The patient should be kept as cool as possible, and avoid undue perspiration. The fears entertained by the laity, of danger from retrocession of the eruption, are groundless; the sooner it disappears, the better for the comfort of the patient.

The food should be light and unstimulating, dispensing with meats and condiments for a few days; wine, spirits, and beer are to be avoided.

The ingestion of water, lemonade, Apollinaris water, Vichy water,

together with refrigerant diuretics, as *potassii citras vel acetas*, a cool apartment, and absolute rest will ordinarily insure speedy relief. *Saline cathartics* are invaluable.

Locally: sponging with *alkaline* lotions, *liquor plumbi subacetatis dilutus, extractum grindeliæ fluidum* well diluted, or a solution of *hamamelis*, or *cupri sulphas* in solution (gr. x—0.6 Gm., *aquæ* f℥j—30 Cc.), or *acidi carbolici* (gr. xx—1.3 Gm.), *glyceriti amyli* (℥iij—90 Gm.), or a dusting-powder consisting of *lycopodium*, *zinci oxidum*, and *amylum*, singly or combined.

PEMPHIGUS.

Synonym. Water blisters.

Definition. An inflammatory disease of the skin, either acute or chronic, characterized by the development of a succession of rounded, irregular-shaped blebs or bullæ, varying in size from a pea to an egg.

Varieties. *Pemphigus vulgaris; pemphigus foliaceus.*

Causes. Obscure. It is usually associated with a depressed state of the general system; disorders of menstruation; during pregnancy.

Pathology. Hebra thus describes the appearance of the blebs: "Sometimes a circumscribed, light-red spot appears, perhaps of the size of a bean or a large coin; this is paler in the centre, and may even present a tinge of white, indicating the point at which the bleb is to form, and from which it will spread outward over the surrounding skin, and, in fact, is at first a wheal, passing afterward into a bleb. In other cases the bleb is not preceded either by a red spot or by a wheal, but begins originally as a small collection of clear fluid beneath the cuticle. Thus, hyperæmia of the skin may exist before exudation is poured out, or the latter may be formed before any congestion of the papillary layer is discoverable."

The contents of the blebs or bullæ are yellowish or colorless serum, of a neutral or alkaline reaction; the older the fluid, the more alkaline it becomes. In the late stages of a bleb the fluid becomes puriform. In rare instances blood is contained in the bleb (*pemphigus hemorrhagicus*).

Symptoms. *Pemphigus vulgaris;* the onset is slow (*pemphigus chronicus*), without constitutional symptoms, or acute (*pemphigus*

acutus), preceded by febrile reaction. The lesions are the successive development of *blebs*, usually from half a dozen to a dozen, varying in size from a pea to an egg, of a round or oval shape, their walls distended with a colorless fluid, the color becoming yellowish or puriform as they grow older. They develop abruptly from the sound skin, with a definite line of demarcation, unattended with symptoms of inflammation. A characteristic phenomenon of the lesion is its successive appearance; a crop no sooner disappears than another forms, throughout the course of the affection, each crop running its course in from three to six or ten days. With the appearance of the blebs occur *itching* and *burning*, usually of a mild character, although occasionally in a distressing degree (*pemphigus pruriginosus*).

Pemphigus malignus is characterized by the great size and number of the blebs, which coalesce, rupture, and are succeeded by excoriated surfaces, which occasionally take on ulcerative action, the patient's health being seriously impaired.

Pemphigus foliaceus differs from pemphigus vulgaris in that the blebs, instead of being distended or tense, are flaccid and only partially filled with fluid, as they rupture before arriving at their state of full development. This variety also appears and disappears in crops. After rupture the fluid immediately dries into thin, whitish flakes, which are detached in quantity, leaving a red, excoriated surface—the rete and corium. If the affection has continued for some time, the skin presents the appearance of a superficial scald. The course of this variety is essentially chronic.

All portions of the body are liable to the lesion, as also the mucous membrane of the mouth and vagina. It is most common, however, upon the limbs.

Diagnosis. In a typical case no difficulty should be experienced in making a diagnosis. The mere presence of blebs, however, does not necessarily constitute pemphigus, for it must be remembered that they are at times developed in other diseases, as well as by artificial means; the appearance of blebs in crops is a strong diagnostic point.

Prognosis. The course of the affection is most uncertain, and relapses are frequent. In arriving at an opinion the occurrence of fatal cases must not be forgotten.

Treatment. Attention to the general health is of the greatest moment. A careful study of the cause should be made, and, if determined, means for its removal are of the first importance.

Two remedies, *arsenicum* and *quinina*, are of great value, the secret of success being the persistent use of the former; or if the latter be used, the dose should be large.

Local measures are also of importance. The blebs should be punctured and evacuated as soon as formed. The use of dusting-powders of *acidum boricum*, *zinci oxidum*, *amylum*, or *violet-powder*, or lotions of *liquor plumbi subacetatis dilutum*, are valuable.

Hebra recommends the continuous bath.

IMPETIGO.

Definition. An acute inflammatory disease, characterized by the development of one or more discrete, rounded and elevated, firm *pustules*, about the size of a pea, unattended with itching.

Causes. Occurs for the most part between the ages of three and ten years, in the well-nourished and healthy. It is not associated with eczema. It is not contagious.

Pathology. The lesion is a well-formed, typical *pustule*, developing abruptly from the surface, containing a whitish-yellow fluid, pus-corpuscles, blood-corpuscles, epithelial cells, and cellular detritus. The abscess or pustule is about the size of a pea, circumscribed, and superficial.

Symptoms. Begins by the development of from one or two to a dozen or more distinct *pustules*, about the size of a split pea, of a rounded shape, raised above the surface, with thick walls, of a yellowish or whitish color, surrounded by a distinct areola, which soon fades, are without a central depression or umbilication, and unattended by either itching or burning.

The affection runs an acute course, usually lasting a couple of weeks. The pustules, after attaining their full size, remain stationary for a few days, when they disappear by absorption and desiccation, the crusts dropping off, displaying a reddish base, which soon disappears without pigmentation or scar.

The pustules occur on all portions of the body, the most frequent locations being the face, hands, fingers, feet, and toes.

Diagnosis. Impetigo is unassociated with general symptoms, and its particular lesion—the pustule—is discrete,—points of importance in the diagnosis.

Eczema pustulosum is also a pustular affection, but the large number, their disposition to coalesce, their location upon an inflammatory base, their rupture and subsequent crusting and itching, are diagnostic points.

The diagnostic points from ecthyma will be pointed out when describing that affection.

Prognosis. Favorable.

Treatment. The pustules should be opened as soon as they mature, the contents removed by washing with tepid bichloride water and the floor covered with *hydrargyri chloridum mite* or *zinci oleatum*.

Coating the pustules with *collodium flexile* or *liquor gutta perchæ*, if they are located where irritation be liable, is valuable.

ECTHYMA.

Definition. An affection of the skin, characterized by the formation of one or more large, isolated, flat *pustules*, situated upon an inflamed base.

Causes. It is most common among those who live in squalor and poverty, and in delicate and poorly-nourished children. Improper and insufficient diet, want of ventilation, excessive work, and uncleanliness are all prominent causes.

Pathology. The lesion is a typical pustular process, severe but superficial, and not extending beyond the papillary layer of the corium. The pustule is situated upon a firm and highly inflamed base; the number varies from one to a dozen or more.

Symptoms. The disease is characterized by the development of one or more, round or oval, yet *flat, pustules*, about the size of a pea-bean, attended with moderate *heat, burning*, and *pain*, and, if the number be large, slight febrile reaction. The pustules are first *yellowish in color*, surrounded by a firm and sensitive *bright-red areola*, the pustule afterward becoming reddish from the admixture of blood, soon drying into flat crusts of a brownish color. The duration of each pustule is between two and three weeks, new ones forming until the cause is removed.

The most prominent sites are the thighs, legs, shoulders, and back.

Diagnosis. Ecthyma and eczema pustulosum have points of resemblance, but a study of the clinical history of the latter should prevent error.

Impetigo differs from ecthyma in the size of the pustule and crust.

Ecthyma differs from a boil in not having a central core.

Prognosis. With care and the removal of the cause, recovery is always prompt.

Treatment. The general treatment of the patient is of the first importance. Nutritious and wholesome food, cleanliness, bathing, fresh air, and regulated exercise should be advised, together with such tonics as *ferrum*, *arsenicum*, *quinina*, *strychnina*, and *mineral acids*.

Locally: Remove the crusts by first soaking with oil or fat, or water dressings, and apply—

℞. Ungt. zinci oxid. benz.,	℥ss	15. Gm.	
Vaselini,	℥ss	15. Gm.	
Hydrargyri ammoniati,	℈j	1.3 Gm.	M.

Ft. ungt. (Duhring.)

Pustules showing a sluggish disposition to heal should be stimulated by touching with either *argenti nitras* or *acidum carbolicum*.

FURUNCULUS.

Synonyms. Furunculosis; furuncle; boil.

Definition. An acute affection of the skin, characterized by the occurrence of one or more circumscribed cutaneous or subcutaneous *abscesses* (boils), which usually terminate by necrosis of the central tissue, its subsequent expulsion in the form of pus or a core, and a resulting cicatrix.

Causes. The result of a depraved condition of the system, induced by general debility, excessive fatigue, nervous depression, improper food and exercise, anæmia, diabetes, uræmia, or the result of local friction, pressure, or contusions.

Pathology. The process resulting in a "boil" has its origin in either a sebaceous gland, a sweat gland, or a piliary follicle, and never begins in the meshes of the corium. "It begins as a small, roundish spot which increases in size until certain dimensions are attained, when it undergoes suppurative change, resulting in the formation of a central point or core, composed of the tissue of the gland in which the furuncle originated, which, together with the pus, is cast off. It shows no disposition to become diffuse, being always a circumscribed inflammation. After the discharge of the core a cavity of more or less depth remains, showing the tissues around it to be hard and infil-

trated. After a few days or a week it fills up by granulation, leaving a cicatrix which is often permanent. The central point or core, when thrown off, is composed of a whitish, tough, pultaceous mass of dead tissue, varying in size with the extent and depth of the inflammation" (Duhring).

Hydro-adenitis, as seen in the axillæ, around the nipples, and about the anus or perineum, differs from the ordinary "boil" merely in being deeper seated.

Symptoms. "Boils" may occur singly, or more commonly in crops of two, three, or more, another crop following their disappearance (*furunculosis*).

The abscess begins as a small, rounded, imperfectly defined, isolated, *reddish spot*, of a highly *inflamed character*, *painful on pressure*, its size gradually increasing, its central point presenting evidences of suppuration. It reaches its full development in about a week, when it consists of a slightly raised, rounded, and pointed inflammatory swelling, with a yellowish point in the centre—the "core." Abscesses with no central suppuration or core are called "blind boils." The size of a developed boil varies from a split-pea to a walnut, the color deep red, with a yellow centre, and is surrounded by a slight areola. The pain of a boil is dull and throbbing, painful on pressure, and is usually worse at night. The constitutional symptoms are mild or severe, according to the number and size of the lesions.

Any portion of the body may be attacked; its preference, however, is for the face, neck, back, axillæ, nipples, buttocks, anus, perineum, and labiæ.

Diagnosis. The characteristics of furuncle are so marked that an error seems impossible. It may be, however, mistaken for carbuncle, the differences between which will be pointed out when discussing that affection.

Prognosis. No danger results from occasional boils, but when occurring in crops, they impair the general health and are rebellious to treatment.

Treatment. The treatment of a single boil is well expressed in the word "time." Warm applications are said to hasten the stage of suppuration, and when reached, an incision permits the expulsion of the "core," after which the cure soon follows. If the lesion is located where friction or pressure is likely, protection by either covering with adhesive or soap-plaster, smoothly spread, is ample.

When, however, successive crops of boils occur (*furunculosis*), the treatment should be both constitutional and local. The general health being below par, such tonics as *arsenicum*, *quinina*, and *ferrum* are of value. *Calcii sulphidum*, gr. $\frac{1}{10}$–$\frac{1}{8}$ (0.0065–0.008 Gm.), every two or three hours, is valuable in these cases.

Locally, attempts to abort the process may well claim attention, among which are: crucial incisions, to relieve the tension of the central point, will often abate the inflammation and prevent the gangrene; this little operation is rendered painless by the use of the ether spray. *Acidum carbolicum*, used in five per centum solution, of which two to five drops may be injected into the apex of the boil, is valuable. Painting the forming boil with *argenti nitras* or *tinctura iodi* is also recommended. A paste made by adding together equal parts of *glycerinum* and *extractum belladonnæ*, will often abort a boil; the same is also claimed for *unguentum hydrargyri nitratis*.

CARBUNCULUS.

Synonyms. Carbuncle; anthrax.

Definition. An indurated, more or less circumscribed, dark-red, painful, deep-seated inflammation of the skin and subcutaneous connective tissue, terminating in a slough and the subsequent production of a permanent cicatrix.

Causes. Not positively determined. A deep-seated bruise is a supposed cause. Perhaps, as in furuncle, impairment of the general health is the important factor. It is generally noted to occur in men more frequently than in women. Diabetes mellitus. A "specific" cause for anthrax is not an improbable discovery.

Pathology. Although Billroth regards furuncle and carbuncle as differing only in degree, the explanation of Warren, of Boston, seems the more probable, he being the first to call the attention of histologists "to the existence of small columns of adipose tissue leading from the panniculus adiposus up to the roots of the lanugo hairs, taking an oblique direction in a line with the erectores pilorum. The inflammation resulting in suppuration of the subcutaneous adipose tissue must either form an abscess or become diffuse. In phlegmonous erysipelas the latter condition is observed; but when the inflammation is in the dermoid texture, the exudates infiltrate the skin and

naturally follow the canals occupied by the 'columnæ adiposæ.' The pressure thus exerted upon the whole dermoid tissue cannot fail to strangulate the circulation, and thus produce gangrene of the tissue, even if the exudate be not poisonous enough to destroy the cells by its presence. It can, by this explanation, be easily understood why this disease is apt to affect the skin on the nape of the neck and the back more than on other parts of the body. At this point the skin is dense, its fibrous element extending deep into the adipose layer, which is surrounded by strong bands; hence, the pus confined in such a place, seeking the easiest outlet, will travel along these miniature adipose canals, producing the peculiar appearance pathognomonic of carbuncle."

Symptoms. Carbuncle is recognized by its form: commencing in the lower layers of the cutaneous tissue, it first resembles a phlegmon, *minus* its bright redness. At first it is somewhat rounded, with a tendency to the production of *vesicles* on its surface, soon, however, becoming firm, circular, and flat, and raised above the surrounding parts, spreading through the subcutaneous tissue and skin, becoming at times enormously large, and having a dark-red or violaceous color. As the disease progresses the pressure of the carbuncles results in the softening of the tissues, the skin becoming gangrenous, breaking down at numerous points, forming perforations, through which centres of suppuration appear in different stages of advancement, either as whitish, fibrous plugs, or as cavities, from which a yellowish, sanious fluid oozes, the surface of the anthrax having a cribriform appearance, perforated like a sieve. The entire mass terminates in a slough, which, on being detached, leaves a large, open, deep ulcer, with firm, everted edges, granulating slowly, a permanent cicatrix marking the site of the lesion. The development of the carbuncle is attended by *severe pain*, of a *deep*, *throbbing*, and *burning character*.

The *constitutional symptoms* vary with the size, number, and severity of the disease; loss of appetite, coated tongue, general malaise, and moderate febrile reaction accompany all cases, to which are added those of septicæmia in severe cases.

The duration is from two to six weeks. Its favorite site is the back of the neck, shoulders, back, and buttocks. It is usually single.

Diagnosis. The disease is distinguished from furuncle by its great size, *its flat* form, its course, the multiple points of suppuration,

and the character of the slough; also by the pain; in furuncle, sensitive and painful to the touch, carbuncle not being particularly sensitive. Furuncles generally occur in numbers or in crops; carbuncle is almost always single.

Prognosis. A guarded opinion should always be given, as death is not infrequent from anthrax, especially in elderly people with impaired health. The mortality, however, is not so great as the laity suppose.

A great danger is septicæmia, from the action of the poison on the blood, or the result of secondary abscesses.

Treatment. Constitutional and local measures are both of the greatest value. Nutritious diet, stimulants, and full doses of such remedies as *tinctura ferri chloridi*, *quininæ sulphas*, *arsenicum*, and *ammonii carbonas* are beneficial. Good results are reported from *calcii sulphidum*, gr. ⅛ (0.008 Gm.), every two hours.

Locally: the crucial incision, so generally practised in former years, is seldom performed now, the frequent occurrence of hemorrhages being too debilitating.

A saturated solution of pure *acidum carbolicum* injected through the several apertures in every direction into the sloughing tissues by the aid of a hypodermic syringe is often successful. The pain is severe, but short-lived.

Prof. Agnew recommends painting *collodium cum cantharide* around the anthrax in the form of a broad zone, the effect of the blister being to relieve the tension. *Tinctura iodi* is also used for a similar purpose. Hebra advocates cloths wrung out in ice-water, or ice bags, in the early stages, changing to warm fomentations as soon as suppuration has begun. Dr. Ashhurst has practised with success the use of pressure by means of adhesive plaster applied in much the same manner as for swollen testicle. Success often follows the application of *unguentum hydrargyri nitratis*, spread at least one-eighth of an inch thick and covered with adhesive plaster, changing every twenty-four hours.

The resulting ulcer, after expulsion of the slough, is to be treated on general principles.

ACNE.

Synonyms. Acne vulgaris; acne disseminata; varus; stone-pock.

Definition. An inflammation, usually chronic, of the sebaceous glands; characterized by the development of papules, tubercles, or pustules, or by a combination of such lesions, usually in various stages of formation, occurring for the most part upon the face.

Varieties. *Acne papulosa; acne pustulosa; acne artificialis.*

Causes. Not always understood, as the affection is frequently associated with apparently the most robust health. A frequent cause is puberty. Among the other causes observed are gastro-intestinal disorders, anæmia, chlorosis, uterine disorders, urethral irritation, scrofula, and the use of large doses of the bromides and the iodides. Acne may exist alone or be associated with comedo or seborrhœa.

Pathology. An inflammation of the sebaceous gland structure and surrounding tissues. There first occurs retention of the sebaceous secretion, which is soon followed by hyperæmia and exudation about the glands and in the gland wall (*acne papulosa*), infiltration of the connective tissue (*acne tuberculа*), followed by suppuration (*acne pustulosa*). If the inflammatory action be severe, destruction of the gland with a resulting cicatrix occurs.

Symptoms. *Acne papulosa* or *acne punctata.* This variety is the earliest stage of the inflammatory action, and is of short duration, soon followed by the development of *pus.* It is characterized by the occurrence of *pin-head* to *pea-sized, flat, more or less pointed papules,* situated about the sebaceous follicles, *lightish in color,* with a minute central black point, the opening of the sebaceous duct. Pustules are not infrequently observed scattered among the papules. The lesion is unaccompanied with either local or constitutional symptoms. While the forehead is the most frequent seat for this variety, they sometimes are seen elsewhere.

Acne pustulosa. This is the fully developed affection. It is seen upon the face, neck, shoulders, and back as *pin-head* to *pea-sized,* rounded or acuminated *pustules,* seated upon an infiltrated, reddish base of superficial or deep inflammatory product (*acne indurata*). Scattered among the pustules may be seen numerous papules. There are no constitutional symptoms, nor is pain present unless the pustule be handled.

Acne artificialis is rather a clinical variety, the result, usually, of large doses of the bromides or iodides, the lesion being identical with acne pustulosa.

Diagnosis. The lesion is so characteristic, the course so chronic, and the location so frequently upon the face, that an error seems impossible.

The resemblance of the papular and pustular syphiloderms must not be mistaken for acne.

Prognosis. Essentially a chronic affection, lasting for a number of years; but if persistent treatment be employed, recovery will occur.

Treatment. To successfully combat an attack of acne, both constitutional and local measures must be employed.

Constitutional treatment. The successful treatment of a case of acne depends upon a knowledge of the cause and familiarity with the constitutional habits of the patient. Disorders of digestion and constipation should be corrected. If anæmia be present, *ferrum* and *arsenicum* are indicated. Scrofula is an indication for *oleum morrhuæ* and *ferri iodidum*. Uterine disorders, if present, should receive proper attention. In young adult males I have seen wonderful improvement follow the passage of a fair-sized bougie once or twice weekly.

Calcii sulphidum, gr. $\frac{1}{10}$–$\frac{1}{2}$ (0.0065–0.032 Gm.), every two or three hours, is valuable in many cases, as is *hydrargyri chloridum corrosivum*, gr. $\frac{1}{100}$–$\frac{1}{60}$ (0.00065–0.0011 Gm.), three times daily. A remedy highly spoken of by Dr. Bulkley is *glycerinum* in tablespoonful doses two or three times daily. Dr. Duhring recommends that it be given in combination with *ferri et quininæ citras*. Professor Bartholow has seen excellent results from the use of *syrupus hypophosphitum compositus* in acne indurata.

Local treatment. In acne of not very long duration I have seen excellent results from the following plan: Just before retiring, the parts affected are to be thoroughly washed with water as hot as can possibly be borne, and after the water has partly dried, the parts are to be thoroughly covered with *sulphur sublimatum*, applied by means of a powder puff-ball, no rubbing or friction to be employed, and on arising in the morning the sulphur is to be washed off with hot water and the face lightly mopped dry, or, what is better, sulphur again applied, if the patient is willing to permit it, during the day.

Dr. Hyde recommends that the contents of the papules and pustules be evacuated by means of a needle, rather encouraging slight bleed-

ing, after which the parts are to be bathed with water as hot as can be tolerated, and, while the part is still wet, it is thoroughly scrubbed with *lotio saponis viridis*, then cleansed with water, carefully dried and anointed with a *sulphur* ointment.

Professor Bartholow suggested, in a case of *acne indurata* seen with the author, the following successful plan. To dissolve the sebaceous matter—

℞. Liquor potassæ, ... f℥j 4. Cc.
Aquæ destil., ... f℥j 30. Cc. M.
Sig.—Applied to the acne spots *only*.

After which they were anointed with—

℞. Plumbi nitrat., ... gr. xv 1. Gm.
Ung. petrolei, ... ℥j 30. Gm. M.
Sig.—Apply twice daily.

Dr. Duhring recommends the use of the following, after washing the parts with hot water:

℞. Sulphuris præcip., ... ℥j 4. Gm.
Glycerini, ... f℥ss 2. Cc.
Adeps benzoat., ... ℥j 30. Gm.
Ol. rosæ, ... ♏ iij 0.2 Cc. M.
Ft. unguentum.
Sig.—To be thoroughly rubbed into the skin at night.

ACNE ROSACEA.

Synonyms. Gutta rosea; rosacea.

Definition. A chronic hyperæmia or inflammatory affection of the nose and cheeks; characterized by redness, hypertrophy of the skin, and dilatation and enlargement of the blood-vessels supplying the part, with the development of more or less acne.

Causes. Not always determined. It occurs in young women about puberty who are anæmic, or suffer from a general debility, nervous irritability or prostration, dyspepsia, or menstrual irregularities. It often appears during the menopause. In young males the affection can often be traced to nervous or general debility or dyspepsia. The use of spirituous liquors or of large amounts of condiments is a frequent cause, as is constant exposure to the weather. It is frequently associated with seborrhœa.

Pathology. There first occurs blood stasis in the vessels of the part, producing the undue redness first noticed. As a result of the stasis, sooner or later the capillaries are dilated and hypertrophied, and following the interrupted circulation inflammation of the sebaceous gland (acne) occurs, with the development of papules and pustules. This constitutes the typical acne rosacea. The affection may proceed no further, remaining at this point for years, or, rarely, the pathology of this stage is exaggerated, the involved tissues all hypertrophying, and the connective tissue undergoing a true hyperplasia, causing increased size and abnormal shape of the nose.

Symptoms. The onset of the affection is slow and insidious, characterized at first by more or less diffused *redness* of the part, the color aggravated by water or cold air. If the nose be the part attacked, it is usually greasy (seborrhœic), and is apt to be cool or even cold. This condition may remain for years, but sooner or later the evidence of dilatation and hypertrophy of the capillaries is apparent by the more decided and permanent redness, and upon close examination the enlarged minute cutaneous blood-vessels are seen as delicate or coarse red lines, running superficially over the skin in an irregular and tortuous course. Soon are developed upon the hyperæmic and hypertrophied skin *papules* (acne papulosa) and *pustules* (acne pustulosa), their number never, however, being very great. *This constitutes true acne rosacea.* The disease may remain in this state, or, rarely, the cutaneous tissues are greatly hypertrophied, the blood-vessels enormously dilated, the glands enlarged, and the connective tissue undergoes hyperplasia, resulting in permanent, dark-red, bulky formations, the shape of the nose being contorted into various irregular forms. Duhring reports a case in which the nose was the size of the patient's fist (rhinophyma).

Diagnosis. The characteristics of the disease are so marked, consisting of rosacea—the dilated and hypertrophic blood-vessels—with papular and pustular acne superadded, that an error can hardly occur.

Lupus vulgaris bears some resemblance to acne rosacea, as it is apt to develop about the face, and especially the nose; but the papules, tubercles, and pustules of lupus vulgaris soon ulcerate, followed by crusts and cicatrices, which never occur in acne rosacea.

Lupus erythematosus may be confounded with acne rosacea if it occurs upon the end of the nose; but in the former the skin is harsh

and covered with adherent whitish and yellowish scales connected with the openings of the sebaceous follicles, which is never the case in acne rosacea.

Frostbite resembles the first stage of acne rosacea, but the history of the two conditions soon determines the diagnosis.

Prognosis. Favorable, if treatment be instituted during the first stage. After hypertrophy has occurred but little can be accomplished.

Treatment. The cause is to be sought for and removed, and the general health promoted. The use of all alcoholic drinks to be interdicted, and only small amounts of tea and coffee are to be allowed. In the first stage good results may be obtained from the following formula, known as "Kummerfeld's lotion":

℞. Sulphur. præcipitat., ...	℥iv	16.	Gm.	
Pulv. camphoræ, ...	gr. x	0.6	Gm.	
Pulv. tragacanthæ, ...	℈j	1.3	Gm.	
Aquæ calcis, ...	f℥ij	60.	Cc.	
Aquæ rosæ, ...	f℥ij	60.	Cc.	M.

SIG.—Shake the bottle before using and apply every few hours.

Or—

℞. Hydrargyri chlor. corrosiv., . .	gr. ij	0.13	Gm.
Ung. petrolei, ...	℥j	30.	Gm.

SIG.—Apply thoroughly.

Or, the following, suggested by G. H. Fox:

℞. Chrysarobini, ...	℥ss	2.	Gm.
Collodii, ...	f℥j	30.	Cc.

SIG.—Put a brush through the cork and paint lesions every evening.

For the second stage stronger applications are usually required. The dilated capillaries should be incised with a sharp knife, in the hope that adhesive inflammation may close the calibre of the vessels, cold water compresses being used to control the bleeding, a few of the dilated vessels being thus treated every day or two, until all have been incised. Another plan is to paint the affected parts, once or twice a week, with a ten- to twenty-grain solution of *potassa*, following its application with an emollient poultice. Electrolysis has also been recommended.

I have had excellent results in two typical cases from a long course of the extract of thyroid gland gr. j–ij (0.065–0.13 Gm.).

PSORIASIS.

Synonyms. Lepra; alphos; psora; English leprosy.

Definition. A chronic affection of the skin, characterized by reddish, more or less thickened and elevated, dry, inflammatory, and somewhat wrinkled patches, variable as to size, shape, and number, and covered with abundant whitish or grayish colored, imbricated scales. It is not contagious.

Cause. Not known. The source of the affection is, no doubt, limited to the skin itself, as no external or internal factors can produce it. It occurs in the robust and in the feeble, and in males and females. It usually first appears in early life, and recurs at intervals for years.

Pathology. "The disease is essentially a hyperplasia of the normal constituents of the Malpighian layer (mucous layer). The increase takes place chiefly in the interpapillary portion of the layer, the growth of which downward causes an apparent increase in the size of the papillæ of the corium, which, however, on closer examination, are found not to be enlarged. In the later stages of the disease the more superficial blood-vessels of the corium become dilated, a more or less considerable emigration of the white blood-corpuscles takes place, and the immediate neighborhood of the vessels, together with the connective tissue of the corium, becomes the seat of a round-cell infiltration, which, with the effusion of serum, separates the connective-tissue bundles and fibers into an open meshwork. During the period of disappearance of the disease there is a gradual return to the normal condition, until the hyperplasia, dilatation of the blood-vessels, and cell infiltration has completely disappeared. The hair in psoriasis is affected from the beginning of the disease, hyperplasia of the external root-sheath, the structure corresponding to the Malpighian layer of the epidermis, taking place, with extension of the hyperplastic structure, into the surrounding cutis. The sebaceous and sweat glands are not at any time affected" (Robinson).

Symptoms. Psoriasis begins as small, *reddish spots*, of the size of a pin's head, which immediately become covered with scanty or abundant *whitish* or *grayish imbricated* scales. The spots gradually increase in diameter, forming patches of various sizes and shapes.

If one of the scales be detached by means of the finger-nail, it will be found to adhere quite firmly to the skin, and to be about the

thickness of a card-board. If the reddish patch thus made bare be pinched up between the finger and thumb, and compared with a similar pinch of the healthy skin, its inflammatory thickening will be discerned. *There is no watery discharge at any time.* The skin between the patches is perfectly healthy.

While the anatomical lesions are always identical, the eruption assumes such features, in the size and shape of the patches, to give rise to special names:

Psoriasis punctata. The eruption occurs as small, rounded patches, about the size of a pin's head. This is a rare variety, as the lesion rapidly increases in size.

Psoriasis guttata. The eruption occurs in the form and size of drops, and when covered with scales gives the skin the appearance of having been splashed with mortar. A quite frequent variety.

Psoriasis nummularis. The eruption resembles variously sized coins. This is frequently as large as the patches grow.

Psoriasis circinata. The eruption about the size of the former variety, the centre clearing away, leaving the skin normal, although it may continue to enlarge at the periphery, after the manner of *tinea circinata.*

Psoriasis gyrata. The eruption in wavy lines, of the width of about half an inch, resembling circles and semicircles. This variety is a continuation of the former, from the joining of the patches of psoriasis circinata.

Psoriasis diffusa. The patches of eruption are large and of irregular shape, covering a considerable amount of surface. This variety occurs more frequently on the front of the leg and the outer aspect of the forearm.

Psoriasis palmaris et plantaris. In these regions the eruption is characterized by larger, thicker, and less lustrous scales, and by the occurrence of deep and painful fissures, from which exudes either a serous or sanguineous fluid.

Psoriasis unguium. In psoriasis of the nails they become thickened, opaque, grayish in color, deeply grooved transversely, and often pitted, and in rare cases the nails are replaced by a scaly incrustation.

Any portion of the body is liable to be attacked with psoriasis. The only discomfort the patient suffers is from the *itching*, which at times is very severe and distressing.

Diagnosis. A typical attack of psoriasis presents no difficulty in diagnosis. There are a few affections, however, which may be confounding in irregular cases.

Eczema squamosum occurring upon the legs closely resembles psoriasis, and if the former has been attended with a very small amount of moisture and the latter has been considerably irritated by scratching, the diagnosis will be very difficult.

The papulo-squamous syphiloderm and psoriasis are frequently mistaken for each other, the diagnosis at times being extremely difficult.

Tinea circinata and psoriasis circinata resemble each other, but the patches of the latter are less inflammatory, red, and infiltrated, and the scales more abundant and larger than the former. Tinea circinata is usually the result of contagion, and the scales contain a fungus.

Seborrhœa of the scalp and psoriasis of the same region are frequently confounded. In the former the scalp is paler, the scales are finer, smaller, more generally diffused, of a grayish or yellowish color, and greasy, sebaceous character. Psoriasis of the scalp is in patches, which are reddish and infiltrated, and there are almost always patches of the disease on other parts of the body.

Prognosis. An attack can easily be removed, but it is always apt to return, so that a permanent cure can never be promised.

Treatment. Constitutional and local measures are both needed in the majority of attacks of psoriasis.

Constitutional treatment. Attention to the general health, removing all deleterious influences, such as dyspepsia, constipation, lithiasis, malaria, anæmia, or catarrhs.

Among the most valuable remedies used in the treatment of psoriasis is *arsenicum*, given in full doses for a long period. It is to be kept in mind, however, that the drug is contraindicated in all acute and inflammatory cases.

Potassii iodidum in full doses, *tinctura cantharides*, *quinina*, *phosphorus*, *acidum carbolicum*, and *pix liquida* have all been used with variable success, often what has proved successful for one patient being useless in another.

Local treatment. The character of the local measures should depend upon the duration of the disease, its extent, location, and obstinacy.

The first step is the thorough removal of the scales. This may be accomplished by repeated washings with soft soap and water, or plain or alkaline baths or medicated washes.

In the early stage, with highly inflammatory symptoms, soothing applications, such as water dressings, or inunctions with oils, of which *oleum olivæ* rubbed over the patch several times each day is very serviceable.

For chronic cases nothing seems comparable with the following formula, suggested by Dr. G. H. Fox:

℞.	Chrysarobini, ...	gr. x–xx–ʒj	0.65–1.3–4	Gm.
	Ætheris et alcoholis, ...	ad q. s.	q. s.	
	Collodii, ...	fʒj	30.	Cc.

Sig.—Rub the chrysarobin with a little alcohol and ether, and add to the collodion.

If a camel's-hair pencil be placed through the cork, this may be painted over the affected patch after the removal of the scales, and after drying it will not stain the clothing. Care must be exercised that the strength be not too great, or dermatitis may result.

The following formula I have never seen fail:

℞.	Chrysarobini, ...	gr. x–xv–xxx	0.6–1–2	Gm.
	Ung. petrolei, ...	ʒj	30.	Gm.

Sig.—Apply to each spot twice daily.

Jamieson recommends the following:

℞.	Ammonii carbonat., ...	ʒij	8.	Gm.	
	Adeps lanæ hydrosus, ...	ʒiv	16.	Gm.	
	Cerati galeni, ...	ad ʒj	ad 30.	Gm.	M.

Sig.—Apply three times a day, followed by a warm bath at night.

Dr. Bramwell, of Edinburgh, reports remarkable success in the cure of psoriasis by the internal administration of "a quarter of a raw thyroid gland, finely minced and concealed in rice-paper, daily," "and no application whatever was made locally." I have had excellent results in six cases with the dried gland in doses of from gr. j–iij (0.065–0.2 Gm.) three times daily.

Among local remedies recommended are: *pix liquida*, *saponis viridis*, *creasotum*, *sulphur*, and *acidum carbolicum*.

HYPERTROPHIES OF THE SKIN.

LENTIGO.

Synonym. Freckles.

Definition. A pigmentary deposit of the skin, characterized by irregularly shaped, pin-head or pea-sized, yellowish, brownish, or blackish spots occurring for the most part about the face and back of the hands.

Cause. In the majority of instances exposure to the sun is the exciting cause.

Pathology. In anatomical structure freckles consist of a circumscribed, increased amount of normal pigment, differing from chloasma only in the peculiar form and size of the deposit.

Symptoms. The number of "freckles" varies from a very few to immense numbers. They occur as brownish or yellowish-brown, small, roundish, irregular spots, most commonly upon the face and hands. Rarely the number is very great, and they give to the skin an uncleanly appearance. They are apt to occur at all ages, but rarely before the third year.

They are unattended with itching or other subjective symptoms.

Prognosis. Usually favorable. Their course, when left to themselves, is chronic, lasting for years or a life-time. They ordinarily appear in the summer, fading away as cold weather approaches, to return the following summer.

Treatment. The following application has usually been successful:

℞. Hydrargyri chlor. corrosiv., . .	gr. iij	0.2	Gm.	
Acid. hydrochlorici dil, . . .	f℥j	4.	Cc.	
Alcoholis, ...	f℥j	30.	Cc.	
Glycerini, ...	f℥ss	15.	Cc.	
Aquæ rosæ, ...	ad f℥iv	ad 120.	Cc.	M.

Sig.—Apply at bedtime, and remove with soap and water in the morning.

CHLOASMA.

Synonyms. Liver spots; moth.

Definition. A pigmentary discoloration of the skin, characterized by variously sized and shaped, more or less defined, smooth patches, or of a discoloration, yellowish, brownish, or blackish in color.

Cause. The etiology of chloasma depends upon whether the pigmentation is idiopathic or symptomatic in its occurrence.

Idiopathic chloasma results from the irritation of long-continued scratching, such as is practised in severe eczema or pediculosis, the application of blisters and sinapisms, heat, the direct rays of the sun, and various medicinal and chemical substances, such as follows the prolonged use of argentum (argyria).

Symptomatic chloasma occurs in connection with cancer, malaria, tuberculosis, disease of the suprarenal capsule (Addison's disease), disease of the womb, pregnancy (chloasma uterinum), neurotic disturbances, dementia, anæmia, and chlorosis.

Pathology. The affection is an increased deposit of the normal pigment having its seat in the mucous layer of the epidermis. The deposition of the pigment is the result of a nervous derangement, possibly of the trophic system.

Symptoms. Chloasma is simply a discoloration of the skin, unattended by alteration of the surface. The patches vary in size and shape; they may be as minute as a coin or as large as the hand, or much larger, even to a universal discoloration of the entire surface, and they may be roundish or irregular in outline. The usual color is *yellowish*, *brownish*, or *muddy*, or even *blackish* (*melasma melanoderma*).

In *Addison's disease*, of a typical character, "the coloration is brownish, with an olive-greenish or bronze tint, and is general, although, as a rule, especially pronounced upon regions having a disposition to normal increase of pigment, as the face, backs of the hands, axillæ, areolæ of the nipples, and the genital organs; the hair, also, may become darkened. Gaskoin reports a case, occurring in a woman aged forty-five, where the patch, situated on the cheek, near the nose, was intensely dark. It had existed nine years. The color of the hair had, fifteen years previously, changed from carroty-red to black. For additional symptoms see page 203.

In *argyria*, or discoloration of the skin resulting from the internal use of nitrate of silver, the color is a bluish, bluish-gray, slate, bronze, or blackish, varying as to the shade. It occurs over the surface generally, but is more pronounced upon parts exposed, as the face and hands.

Chloasma uterinum occurs most frequently between the ages of twenty-five and fifty, seldom after the menopause, caused, in the

greater number of instances, by changes, physiological and pathological, which take place in connection with the uterus. It is seen in the married and single, although much commoner in the former. Pregnancy is the most frequent cause, although also associated with either dysmenorrhœa, chlorosis, anæmia, or hysteria. It is seen in the mildest degree about the eyelids, especially during the menstrual epoch, as a duskiness or swarthiness of the complexion, either lasting a few days or being permanent. As usually encountered, however chloasma of this variety consists in the presence of one or several patches, appearing generally about the forehead orother parts of the face, upon the trunk, about the nipples, and upon the abdomen. Rarely the entire face is covered with a discoloration, resembling a mask. Cases are recorded in which the pigmentary deposit was general, resembling Addison's disease.

Diagnosis. Tinea versicolor and chloasma resemble each other in the color of the patches, but otherwise they have nothing in common. Tinea versicolor occurs on the trunk, while chloasma occurs upon the face and about the nipples, and in cases the result of pregnancy about the umbilicus, except in those comparatively rare instances in which the discoloration is diffused. The patches of chloasma are smooth, those of tinea versicolor furfuraceous, as can readily be demonstrated by gently scraping the discoloration with the finger-nail.

Prognosis. Unless the result of Addison's disease, the prolonged use of argentum, tuberculosis, or cancer, favorable.

Treatment. Chloasma not the result of organic disease or the use of argentum is usually removed by either of the following formulæ:

℞. Hydrargyri chloridi corrosiv., .	gr. viiss	0.5 Gm.	
Zinci sulphat., ...	ʒss	2. Gm.	
Plumbi acetatis, ...	ʒss	2. Gm.	
Aquæ, ...	f ʒiv	120. Cc.	M.

Sig.—Lotion. Apply morning and evening. (Hardy.)

Or—

℞. Hydrargyri chloridi corrosiv., .	gr. vj	0.4 Gm.	
Acidi acetici dil., ...	f ʒij	8. Cc.	
Boracis, ...	℈ ij	2.6 Gm.	
Aquæ rosæ, ...	f ʒiv	120. Cc.	M.

Sig.—Lotion. Apply twice daily. (Bulkley.)

Or—

℞. Hydrarg. ammoniat., ...	ʒj	4. Gm.	
Bismuthi subnit., ...	ʒj	4. Gm.	
Ung. petrolei, ...	ʒj	30. Gm.	M.

Sig.—Apply frequently.

For *argyria* the first step is the withdrawal of the argentum, and, according to Prof. Bartholow, "a persistent and long-continued use of *potassii iodidum* and *sodii hypophosphitis* has, in a few fortunate instances, caused the absorption and excretion of the silver deposits." The action of these systemic remedies for the discoloration may be aided by baths of the *hyposulphites*, and by the cautious use of lotions containing *potassii cyanidum*, which possesses a decided solvent power over the silver deposits.

CALLOSITAS.

Synonyms. Tyloma; callus; callosity.

Definition. Callositas, or tyloma, consists in the development of a hard or horny, thickened patch of skin, variable in extent, and of a grayish, yellowish, or brownish color, and unattended by pain. The most frequent location is upon the hands and feet.

Causes. The result of pressure or friction, as in the case of the hands of the mechanic, the effect of his tools; or, if upon the foot, the result of ill-fitting shoes or from long marches. Callosities are also seen upon the fingers of violin, banjo, and harp players.

Pathology. A hypertrophy of the horny layer of the skin, the corium remaining normal. The cells of the epidermis become so closely packed together as often to simulate horn substance.

Symptoms. Callositas consists in an increase in the thickness of the skin of the affected part, presenting a firm, dense, more or less circumscribed structure, the extent of hardness varying considerably, sometimes being horny. The patch of hardness is generally about the size of a coin, roundish in shape, and somewhat elevated above the surrounding skin. The color of the patch may be either grayish, yellowish, or brownish.

Callosities are usually upon the palms, fingers, soles, and toes, although other parts, if exposed to the cause, may also be the seat. At times great pain and discomfort are experienced from the growth.

Occasionally callosities are complicated by hyperæmia, fissure, acute inflammation, abscess, erysipelas, and serve readily as foci for such cutaneous diseases as eczema and psoriasis.

Course. Their formation and development is always slow and gradual. If the cause be removed, the prognosis is favorable.

Treatment. If the removal of the callous growth be desirable, the part should be repeatedly soaked in warm water, or a poultice applied, or warmed oil kept in contact by compresses of flannel, which will soften the induration and permit its removal by paring or scraping, layer by layer, with a sharp knife. Success has been reported from the use of a plaster of india-rubber containing *acidum salicylicum*. Painting with diluted *tinctura iodi* once daily is often serviceable.

CLAVUS.

Synonym. Corn.

Definition. A corn is a small, circumscribed, usually flat, deep-seated hypertrophy of the epidermis, having a horny feel, projecting slightly from the skin, painful upon pressure, situated for the most part about the toes.

Cause. Continued pressure or friction, usually from ill-fitting or tight boots or shoes.

Pathology. A clavus consists of a circumscribed, excessive hypertrophy of the epidermis, of the same character as occurs in callosity, and of a central portion—the *core*. The core extends deeply into the tissues, in the shape of an inverted cone, the base of the cone being directed outward and appearing upon the surface as a roundish elevation, its apex resting upon the papillary layer of the corium. The core of a clavus consists of a whitish, opaque, firm, tenacious body, composed of epidermic cells, arranged in concentric laminæ.

The pain attending the presence of corns results from pressure upon the true skin by the hard core, causing irritation of the nerve-filaments of the papillæ.

Corns existing between two toes are constantly bathed with the moisture of the part, which macerates and softens the formation, which thus receives the name of *soft corn*, in contradistinction to the hard corn.

Symptoms. Until the growth attains a considerable size no discomfort, as a rule, is felt. After, however, its depth has reached the true skin, *pain*, of an intermittent character, aggravated by pressure, is the chief symptom.

Corns are often weather sensitive, being unusually painful before, during, or after the occurrence of storms, and should, therefore, not be confounded with gouty or rheumatic deposits below the skin.

Treatment. If freedom from these annoying formations be desired, the use of a properly fitting foot-covering must be practised. The pressure which results in the severe pain is limited by the use of the ringed protective plasters in common use.

To remove the corn, soaking with hot water, or a poultice kept in contact over night, will soften the part and permit of its ready removal with the knife.

For *soft corns*, the application of *argenti nitras*, in solid stick form, is highly spoken of, to be used after the growth has been sufficiently softened. The following application will usually remove the "corn":

℞. Acidi salicylici, ... ʒiss 6. Gm.
Ext. cannab. indicæ, ... gr. x 0.6 Gm.
Collodii, ... fʒj 30. Cc. M.

Sig.—Painted over corn at night and scraped off in the morning.

VERRUCA.

Synonym. Wart.

Definition. A wart consists of a circumscribed hypertrophy of the papillary layer, with more or less epidermal accumulation, characterized by the appearance of a hard or soft, rounded, flat, or acuminated formation, of variable size.

Varieties. The following varieties have chiefly a descriptive value: *verruca vulgaris; verruca plana; verruca filiformis; verruca digitata; verruca acuminata.*

Cause. Obscure. The various assigned causes are probably incapable of producing the affection.

Pathology. While the anatomy of warts differs somewhat according to their variety, in all forms there exists as a basis of their formation a connective-tissue growth from which the papillary hypertrophy takes place. The interior of the growth is supplied by one or more vascular loops, from which their vitality is obtained.

Symptoms. The various forms are so different as to require a separate description.

Verruca vulgaris, or the ordinary wart commonly seen on the hands, consists of a small, circumscribed, elevated growth, having a broad base seated securely upon the skin. Their consistency is either soft or firm, the surface smooth or rough, the color that of the surrounding skin, or yellowish, brownish, or even blackish. They may develop upon any region of the body, but are most commonly seen upon the hands and fingers.

Verruca plana differs from the vulgaris in being flat and broad in form, and but slightly raised above the level of the surrounding skin. Their most common location is either on the back or forehead.

Verruca filiformis assumes the shape of a minute, thin, conical, or thread-like formation, about an eighth of an inch in length. The most frequent location is the face, eyelids, and neck.

Verruca digitata consists of a slightly elevated, broad formation, about the size of a split pea, and marked by a number of digitations coming from its border, giving an appearance, in marked cases, resembling a crab. Their most frequent site is upon the scalp.

Verruca acuminata, known also as the pointed wart, the moist wart, the pointed condyloma, cauliflower excrescence, and venereal wart, consists of one or more groups of irregularly shaped elevations, often so closely packed together as to form a more or less solid mass of vegetations (verrucæ vegetantes). Their color depends somewhat upon the degree of vascularity, varying from a pinkish, bright red to a purple color. They occur, for the most part, about the genitalia of either sex. Upon the penis, they usually spring from the glans and the inner surface of the prepuce. From the inner surface of the labia and from the vagina in the female. They are also seen about the anus, mouth, axillæ, umbilicus, and toes. They may be either moist or dry, according to their location. About the genitalia, a yellowish, puriform secretion usually covers their surface, due to friction and maceration, which, owing to the heat of the parts, rapidly decomposes, producing a highly offensive, penetrating, and disgusting odor. Their size varies from that of a pea to that of an almond, an egg, or even the fist. Their development is rapid, attaining considerable size in a few weeks.

Prognosis. Favorable.

Treatment. For the smaller warts, excision by means of the

knife or scissors affords the most satisfactory results. If the growth be large, and likely to be attended with considerable hemorrhage, as in cases of condyloma about the genitalia, the galvano-caustic wire or the Paquelin cautery are to be preferred. Transfixing the growth in several directions with long needles dipped in a fifty per centum solution of *acidum chromicum* has been recommended. The topical application of caustics, such as *acidum aceticum*, *acidum nitricum*, *argenti nitras*, or *ferri perchloridum* is often satisfactory. I have been successful in some cases by painting the growth with *tinctura thuja occidentalis* until their size was considerably reduced and then snipping them off with the scissors. The following formula for warts and corns is usually successful:

℞. Acidi salicylici, ... ʒss 2. Gm.
Ext. cannab. indicæ, ... gr. v–x 0.3–0.6 Gm.
Collodii, ... fʒss–j . 15.–30. Cc. M.
Sig.—Apply once or twice daily.

An excellent formula is—

℞. Acidi salicylici,
Acidi borici, ... āā gr. xv āā 1. Gm.
Hydrargyri chlor. mitis, ... gr. x 0.6 Gm. M.
Sig.—Sprinkle over twice daily.

ICHTHYOSIS.

Synonyms. Ichthyosis vera; fish-skin disease.

Definition. Ichthyosis is a congenital, chronic deformity or hypertrophic disease of the skin, characterized by dryness, harshness, or general scaliness of the skin, or in the outgrowth of larger masses of a corneous consistency.

Varieties. *Ichthyosis simplex; ichthyosis hystrix.*

Cause. Often hereditary, but not in all cases. It is to be regarded as an affection which is born with the individual, although it does not usually manifest itself until after the first or second year of life.

Pathology. "The diseased or, better, deformed skin is found microscopically to be hypertrophied in various degrees, according to the development of the malady; the proliferation of its elements occurring in the connective tissue, papillæ, stratum corneum, and

blood-vessels. In well-marked cases of ichthyosis hystrix the elongated papillæ are surrounded by dense cones of the horny layer of the epidermis, more or less concentrically disposed, with sclerosis of the connective tissue and a relatively unchanged rete. In this last particular the dense plaque of ichthyosis differs in texture from the wart" (Hyde).

Symptoms. Ichthyosis displays wide variation in its symptoms. In one individual it amounts to slight inconvenience, while in another it may manifest itself in so pronounced a manner as to be the source of great discomfort and deformity. The two varieties named represent merely accentuated types of the disorder, rare in its fullest development, and, in its slightest, much more common than is generally believed.

A simple dryness and harshness of the skin, with only slight furfuraceous exfoliation, is termed *xeroderma*.

Ichthyosis simplex is the more common variety, consisting of a harsh, dry condition of the whole surface, accompanied by the production of variously sized and shaped reticulated scales, either small, thin, and furfuraceous, like bran, or large and thick, resembling fish-scales. Upon the extremities the scales usually form diamond-shaped or polygonal plates, separated from one another by furrows or lines which extend down to the normal skin. In color the scales are either whitish, grayish, or yellowish, and often have a silvery or glistening appearance. Rarely the color is olive-green or blackish (*ichthyosis nigricans*). The amount of scaling depends upon the age of the patient and the duration and severity of the disease.

Ichthyosis hystrix. With or without the development of the above variety, in this, the hypertrophy of the skin may occur in circumscribed patches or large areas, consisting of irregularly shaped verrucous, corneous, corrugated, wrinkled, or rugous masses, usually darker in color than those of the simple variety. They may occur upon the arms, as solid, warty patches, or upon the back, in the form of elongated, linear patches. They may constitute roughened, corrugated, papillary growths, or uneven, horny, blunt, or pointed, spinous, warty formations. In the latter case the elevations may reach several lines or more, and stand out from the skin like quills upon the back of a porcupine—hence the name hystrix. The amount and extent of the hypertrophy varies; the older the patient, the more highly developed it will usually be.

Course. *Ichthyosis simplex* may involve the entire surface uniformly or appear more marked on the extremities, from the hips to the ankles and the arms and forearms. The affection is always worse in winter than in summer, the increased activity of the sweat glands at this season producing the most beneficial results. The course of the affection is essentially chronic, continuing throughout life, now better, now worse. Slight itching usually occurs.

Diagnosis. The characteristics of the affection are so peculiar that an error in diagnosis is hardly possible. It is to be distinguished from the inflammatory affections of the skin which terminate in desquamation by the absence of any history of inflammation.

Prognosis. While much can be done to alleviate the affection, the prognosis is unfavorable as regards permanent relief.

Treatment. Local measures are alone of value for ichthyosis. The maceration of the accumulated masses of epithelial hypertrophy is accomplished by water-baths, either simple or medicated. The relief thus afforded the patient, while temporary, is comforting. Duhring says: "It may be stated, then, that, as a rule, the more frequently the ichthyotic patient bathes, and the longer he is able to remain in the water, the less will the deformity show itself." Vapor and alkaline baths are also serviceable. Another valuable agent is *sapo mollis* in conjunction with baths, or alone, as a discutient. For severe cases, "a sufficient quantity is to be rubbed into the skin twice daily for four or six days, during which period the patient is to refrain from bathing. A bath is first to be taken four or five days after the last rubbing, when, in fact, the epidermis has begun to peel off; afterward inunction with a simple ointment is to be applied, in order to prevent fissuring of the new skin.

The following is a useful formula:

℞. Adeps benzoat., ...	℥j	30. Gm.	
Glycerini, ...	♏xl	2.6 Cc.	
Ung. petrolei, ...	℥ss	15. Gm.	M.

Sig.—Apply daily, after washing or bathing.

Or—

℞. Potassii iodidi, ...	gr. xx	1.3 Gm.	
Olei bubuli, ...	f℥ss	15. Cc.	
Adeps, ...	℥ss	15. Gm.	
Glycerini, ...	f℥ij	8. Cc.	M.

Sig.—Apply after bathing. (Milton.)

PARASITIC DISEASES OF THE SKIN.

TINEA FAVOSA.

Synonyms. Favus; porrigo favosa; honeycombed ringworm; crusted ringworm.

Definition. A *contagious* affection of the skin, due to a vegetable parasite—*Achorion Schönleinii;* characterized by the development of either discrete or confluent, small, circular, cup-shaped, *pale-yellow*, friable crusts, usually perforated by hairs.

Cause. The presence and growth of a vegetable parasite known as the *Achorion Schönleinii* is the cause of tinea favosa. It is commoner in children than in adults, attacking the former in the first place either *de novo* or through direct contagion, and is from them communicated to adults. It is a disease confined almost exclusively to the lower classes.

Pathology. Tinea favosa may have its seat either in the hair-follicles and hair, or upon the surface of the skin or the nails; the former, however, are the structures most frequently involved.

It is purely a local affection, due solely to the presence and growth of the vegetable parasite discovered by Schönlein, of Berlin, in 1839, and named after him—*Achorion Schönleinii.* The crusts are made up almost entirely of fungus, which is seen, upon section, with the naked eye, to be composed of a porous mass and to possess a pale-yellow or whitish color. Under the microscope it is seen to consist of both mycelium and spores in great quantity and in all stages of development.

Symptoms. When the affection attacks the hairs and follicles it is termed *tinea favosa pilaris;* when the epidermis, *tinea favosa epidermis;* and when the nails, *tinea favosa unguium.* Rarely all the structures may be attacked at one and the same time; its usual seat, however, is the scalp.

The disease begins by the development of one or of several *pin-head-sized, pale-yellow crusts*, seated about the hair-follicles. In about a fortnight these crusts have increased in size and are umbilicated, termed the *favus cups*, are circumscribed, circular in form, and very slightly elevated above the level of the skin.

In their normal condition they are of a pale-yellow or sulphur-

yellow color, but after a time, from dust and other matters, they become brownish or greenish yellow in color. The number of crusts vary from very few to immense numbers. The usual size is about that of a split pea. In *tinea favosa pilaris et capitis* the affection is often accompanied by pediculi, while swelling of the glands of the neck and small abscesses upon the scalp are not uncommon. The hairs become lustreless, opaque, brittle, and at times split longitudinally, and from atrophy of the follicles and sebaceous glands permanent baldness may result.

In *tinea favosa unguium* the nails become thickened, yellow, opaque, and brittle.

The disease has a peculiar *odor*, resembling that of *mice*, or of *musty, stale straw*.

Diagnosis. In a recent case of characteristic favus cups, the pale-yellow color, the odor, and the history of contagion should render the diagnosis easy. If of long standing, however, and the favi destroyed by scratching, some doubt may exist; but if a small fragment of a crust be placed upon a glass slide with a drop of *liquor potassæ*, covered with a thin glass, and placed under a microscope with a power of from two hundred and fifty to five hundred diameters, the features of the *Achorion Schönleinii* will determine the diagnosis.

Prognosis. Tinea favosa of the epidermis readily responds to treatment. Tinea favosa pilaris is more obstinate, and if of long duration, may result in baldness.

Treatment. The general health, in the majority of instances, requires tonics. *Oleum morrhuæ*, and *syrupus ferri iodidum*, are invaluable to scrofulous patients. Cleanliness is essential to successful management.

For *tinea favosa pilaris et capitis* two remedies are essential—*parasiticides* and *depilation*. The hair should be cut off as short as possible, the crusts removed by the use of oil, or soap and hot water, or poultices, again well oiled, and the hairs removed by means of broad-bladed forceps, a few hairs being removed at a time and only a small surface cleared at each sitting, when the following lotion is to be thoroughly applied:

℞. Hydrarg. chlorid. corrosiv., . . .	gr. v–x	0.3–0.6	Gm.	
Ammonii chlorid., ...	ʒ ss	2.	Gm.	
Misturæ amygdalæ amar., ...	f ʒ iv	120.	Cc.	M.

Sig.—Apply thoroughly. (Bulkley.)

Dr. Shoemaker condemns epilation as injurious to the "hair-follicles and painful to the patient, and should be discarded as a relic of medical barbarism of the last century." He recommends "the application of *oleum ergotæ*, for twenty-four hours, to soften the crusts; then apply a twenty-five to a fifty per centum solution of boroglyceridum, sponged thoroughly over the affected surface covered with the oil; in a few hours the crusts will peel off and the surface can be cleansed, when the following powerful antiparasitics should be applied":

℞. Ung. hydrargyri oleat., ... ℥ss 15. Gm.
Adeps, ... ℥ss 15. Gm.
SIG.—Apply a small portion to each cup daily for two or three days.

Then alternate with the following:

℞. Cupri oleat., ... ℥ss 2. Gm.
Adeps, ... ℥j 30. Gm.
SIG.—Small portion to the affected spots.

"These applications should be made every day or two, and continued for three or four weeks. If, after a cessation of treatment for a week or two, the hair does not assume its natural aspect and new favus crusts develop, the treatment should be begun afresh."

TINEA CIRCINATA.

Synonyms. Tinea trichophytina corporis; herpes circinatus; ringworm of the body.

Definition. A *contagious*, parasitic affection of the skin, due to the *trichophyton fungus;* characterized by the development of one or more circular or irregularly shaped, variously sized, inflammatory, slightly vesicular or squamous patches, occurring upon the general surface of the body.

Causes. Ringworm of the body is caused by the presence of a vegetable parasite discovered by Bazin, in 1854, termed the *trichophyton*, the same growth or fungus that produces tinea tonsurans and tinea sycosis. The affection is highly contagious, and is frequently communicated from one member of a family to another, although it has been determined that a certain unknown condition of the skin is requisite for its development. In children it is most frequently seen among the weakly and the poorly nourished. In adults it is usually associated with a decline in the general health.

Pathology. The fungus is seated between the strata of the epidermis, more particularly in the superior layers of the rete. The presence of this foreign body produces the subsequent phenomena—a superficial dermatitis, erythema, exudation, minute vesiculation and papulation, and, in the severe grades, tubercles and pustules. The desquamative symptoms are exfoliative—nature's efforts for relief.

Symptoms. Tinea circinata varies greatly in the degree of its development, from the trivial complaint so often seen in children, to the chronic, extensive, and obstinate disease sometimes seen about the thighs in adults (*tinea circinata cruris*).

The disease usually begins as a small, reddish, scaly, rounded or irregularly shaped spot of papules, which in a very few days assumes a circular form (ringworm). It continues to increase in size, the papules often changing to vesicles. A characteristic of the eruption is its healing in the centre as it spreads on the periphery. Occasionally the circles or rings coalesce, forming serpiginous lesions. The usual size of a fully developed ringworm is about that of a silver quarter of a dollar.

Chronic tinea circinata does not present the characteristic annular form, but " are usually in the form of single or multiple, disseminated, small, reddish, slightly scaly, ill-defined spots, on a level with or but slightly raised above the surrounding skin. Not infrequently they are the size of a small or large finger-nail, and are irregularly shaped, and, as a rule, without line of demarcation."

The "eczema marginatum" of Hebra is to be looked upon as a severe form of tinea circinata.

Tinea circinata cruris, or ringworm of the thighs, a variety of the "eczema marginatum" of Hebra, is usually complicated with true eczema, and is a very obstinate, chronic form of the affection; it is accompanied by severe itching.

Tinea trichophytina unguium is a rare variety. The nails become opaque, whitish, thickened, and soft and brittle, especially along their free border. The microscope is essential for a diagnosis. Its course is chronic, and it is difficult to cure.

Course. As commonly seen, ringworm is very amenable to treatment. Occasionally, however, it exhibits great obstinacy, showing itself repeatedly in the same region in the form of relapses, or manifesting itself from time to time in new localities.

Diagnosis. Tinea circinata may be mistaken for squamous or

other varieties of eczema, but the circular and often annular form, the well-defined margin, the slight desquamation, and the course and history of ringworm should prevent error. Chronic ringworm is more difficult, however.

Seborrhœa and psoriasis often assume a somewhat circular form, and then have a resemblance to ringworm, but a study of the clinical history should render the diagnosis easy.

All doubtful points in diagnosis should be determined by the microscope. The examination can readily be made in the following manner: "A few of the scales may be scraped, with a blunt knife-blade, from the suspected patch and placed upon a glass slide containing a drop of liquor potassæ, over which is laid a thin glass cover. The cover should be pressed down and the epidermic mass flattened out. Permitting the specimen to remain for a few minutes, it may be viewed with a power of from 250 to 500 diameters. The fungus will, in most cases, be detected here and there, having at first a faint outline, but becoming more distinct as the specimen stands."

Prognosis. Favorable, as a rule, although the affection is rebellious to treatment in some instances, and prone to relapses.

Treatment. Local treatment is usually all that is required for the cure of tinea circinata. In the majority of instances the following plan will be successful. Washing the patch with soft soap and water and the application of one of the following ointments:

℞. Cupri acetat., ... gr. x 0.6 Gm.
Ung. aquæ rosæ, ... ℥j 30. Gm. M.
Sig.—Keep in contact with the patch.

Or—

℞. Hydrargyri ammoniat., ... gr. xx–xxx 1.3–2. Gm.
Ung. petrolei, ... ℥j 30. Gm. M.
Sig.—Keep in contact with the patch.

Or—

℞. Hydrargyri chloridi cor., . . . gr. j 0.065 Gm.
Tinct. benzoin. comp., ... f℥j 30. Cc. M.
Sig.—Apply over eruption.

Or—

℞. Sulphuris, ... ℥j 4. Gm.
Acid. borici, ... ℥j 4. Gm.
Vaselini, ... ℥j 30. Gm. M.
Sig.—Apply after scrubbing patch with green soap.

In obstinate tinea circinata cruris a saturated solution of *acidum boricum*, applied for a few days, and afterward cover the parts with the acid in powder, or *unguentum hydrargyri ammoniatum*.

TINEA TONSURANS.

Synonyms. Tinea trichophytina capitis; herpes tonsurans; ringworm of the scalp.

Definition. A *contagious*, parasitic affection of the scalp, due to the *trichophyton fungus;* characterized by the development of circumscribed, vesicular or squamous, more or less bald patches, showing the hair to be diseased and usually broken off close to the scalp.

Cause. The result of the presence and growth of the same fungus giving rise to tinea circinata—*trichophyton*. It is an affection of childhood, seldom being seen after puberty. It is highly contagious, and may be communicated from a case of ringworm of the body.

Pathology. The parasite, originally named "*trichophyton tonsurans*," invades the hair, hair-follicles, and epidermis of the scalp, the hair, however, suffering the most severely, becoming in a short time filled with the growth to such an extent, usually, as to cause its disintegration and destruction. The hair-follicle, also, becomes distended and prominently raised. The hair-shaft is fractured just above the level of the scalp, and usually presents a jagged, bristly, stubble-like extremity. The epidermis of the scalp may either present the changes of minute vesicles and desquamation, or, in severe cases, œdema and inflammatory symptoms, with fluid exudation (*tinea kerion*).

Symptoms. Ringworm of the scalp usually begins in the form of small circumscribed patches, which soon become the seat of small vesicles or pustules, which terminate in desquamation, or of furfuraceous scales. The patches spread rapidly, soon reaching the size of a silver quarter to that of a silver dollar. They are circular in form, circumscribed, of a reddish, grayish, or greenish-yellow color, covered with fine or coarse scales, with the hairs broken off close to the scalp. The epidermis of the scalp is more or less raised, and the follicles are prominent, giving the characteristic appearance of the disease—the goose-skin or plucked-fowl appearance. As a result of the loss of hair, baldness, more or less complete, but temporary, exists.

Itching, slight or severe, is a constant symptom.

Ringworm of the face or body (*tinea circinata*) may complicate tinea tonsurans.

Chronic ringworm of the scalp is the same condition in a more chronic form, having existed for six months to a year or two.

Tinea kerion is a severe variety of tinea tonsurans, "characterized by œdema, inflammation, and the exudation of a viscid, glutinous, yellowish secretion from the opening of the hair-follicles. When fully developed the patches are yellowish, reddish, or purple in color, and are more or less raised, œdematous, and boggy. They are uneven and honeycomb-like (hence the name kerion), and studded with yellowish, suppurative points, or, later, with small cavities or foramina, the openings of the distended hair-follicles deprived of their hairs, which discharge a mucoid, gummy, honey-like fluid."

The patches are tender, painful, and at times the seat of itching. The course of the affection is chronic.

Diagnosis. The diagnosis is usually unattended with difficulty, if the characteristic circumscribed vesicular or scaly patches with stubby hair be present.

Squamous eczema somewhat resembles tinea tonsurans, but the hairs are normal in eczema and firmly imbedded in the follicles, while they are almost always stumpy in ringworm, and in those cases in which they are not broken off, if pulled, they easily fall out. Ringworm is contagious, eczema is not.

Alopecia areata presents a white, shiny, ivory-like, bald patch, devoid of scales, eruption, or hair. Ringworm has the vesicular or scaly patch, with broken-off hairs.

In any case of doubt the microscope will readily determine the diagnosis, if "one or two of the short, stumpy hairs should be placed upon a slide with a drop of *liquor potassæ* and permitted to stand a few minutes, when under a power of two hundred and fifty diameters the fungus, as well as the lesions of the hair, will be visible."

Prognosis. Favorable, although obstinate in chronic cases. Relapses are of frequent occurrence.

Treatment. Local measures are usually satisfactory. Mild cases should be treated by cutting the hair as close as possible and thoroughly scrubbing the patches with *sapo viridis* and water, or the application twice daily of a twenty-five to a fifty per centum solution of boroglyceridum, or a six per centum solution of *oleatum hydrargyri*, or either of the following:

℞. Sodii borat., ... ʒj 4. Gm.
Aceti destil., ... fʒij 60. Cc. M.
SIG.—Apply thoroughly several times daily.

Or—

℞. Acidi borici, ... gr. xv 1. Gm.
Sulphur. flor., ... gr. xv 1. Gm.
Vaselini, ... ʒiss 45. Gm. M.
SIG.—Apply morning and night.

Or—

℞. Cupri oleat., ... ʒss 2. Gm.
Ung. petrolei, ... ʒij 60. Gm. M.
SIG.—Apply after using boric solution.

Or use may be made of Morris' thymol solution, to wit:

℞. Thymol, ... ʒss 2. Gm.
Chloroformi, ... fʒij 8. Cc.
Ol. olivæ, ... fʒvj 24. Cc. M.

A preparation very popular in London, known as Coster's paste, is used by painting the patches with a brush and allowing it to remain on until the crust is cast off, in the course of five or six days, when it may be reapplied. A few applications often suffice. Its formula is—

℞. Iodi, ... ʒij 8. Gm.
Olei picis, ... fʒj 30. Cc. M.
The iodine and oil of tar should be gradually and slowly mixed.

An excellent application in rebellious cases is—

℞. Potassæ (caustic), ... gr. ix 0.6 Gm.
Acid. carbolici, ... gr. xxiv 1.5 Gm.
Adeps lanæ hydrosus, ... ʒss 15. Gm.
Ol. theobromæ, ... fʒss 15. Cc. M.
SIG.—A small amount rubbed into head night and morning. If the scalp is not shaved, the application is retained better.

The following is an excellent application for the scalp in tinea tonsurans and other scalp diseases:

℞. Ung. acid. borici, ... ʒij 60. Gm.
Ung. eucalyptol, ... ʒij 60. Gm.
Ol. caryophylli, ... fʒss 2. Cc.
Glycerini, ... q. s. q. s. M.
Ft. unguentum.

Cases which resist these means are to be treated by removing the

loose hairs about the edges of the patches and the broken-off hairs over the surface by means of small, broad-bladed, short forceps, a few hairs only being seized at a time, a portion of the diseased hairs to be removed each day until the surface has been cleared. After each depilation one of the above formulæ to be applied.

TINEA SYCOSIS.

Synonyms. Tinea trichophytina barbæ; sycosis parasitica; barbers' itch; ringworm of the beard.

Definition. A *contagious*, parasitic affection of the hair, hair-follicles, and subcutaneous tissues of the hairy portion of the face and neck in the adult male, due to the *trichophyton fungus;* characterized by the development of tubercles and pustules.

Causes. Tinea sycosis is the result of the presence and growth of the same vegetable parasite that causes tinea circinata and tinea tonsurans—*trichophyton*—which invades the hair-follicle and hair. It is highly contagious, and is said to be acquired, in most cases, at the hands of the barber (?). It is not a very common affection. Like the other vegetable growths, it seems to require some peculiar, unknown condition of the skin for its development. It may develop from a case of tinea circinata or develop simultaneously with it.

Pathology. The parasite finds its way into the hair-follicles and attacks the root and shaft of the hair, causing inflammation, followed by more or less follicular suppuration and general infiltration of the surrounding tissues. The irritation caused by the presence of the fungus results in inflammation of the subcutaneous connective tissue and the well-known tubercular formations peculiar to the affection. They are firm, comparatively painless, and manifest but little disposition to undergo change, remaining during the presence of the fungus and finally gradually disappearing without leaving a scar. Under the microscope the parasite is plainly discernible.

Symptoms. Barbers' itch begins as an attack of tinea circinata—as one or more reddish, scaly patches. Soon the redness and desquamation become more decided, attended with swelling and induration. The hairs will also be dry, brittle, inclined to break, and many of them are already loose. The process rapidly increases, the skin becomes distinctly nodular and lumpy, and points of pustulation de-

velop about the openings of the hair-follicles. The subcutaneous connective tissue is also involved, giving rise to thick, firm masses of induration.

The surface has a dark-red or purplish color, and is studded with variously sized tubercles and pustules. In some instances the number of tubercles are in excess, while in others the pustules are more numerous, numbers of them discharging, and are succeeded by thick crusts, which are often so abundant as to simulate pustular eczema.

The hairs are always diseased, and break off either in the follicles or just above the level of the surface. Those not breaking drop out, leaving the region partly or wholly devoid of hair.

The most frequent location attacked is the chin, neck, and submaxillary region. One or, what is more common, both sides of the face are involved.

Itching, *burning*, *pain*, and *swelling* always accompany the affection, varying in intensity from moderate to very severe.

The course of the affection is usually chronic. Relapses are frequent, unless most thoroughly eradicated.

Diagnosis. *Sycosis non-parasitica* occasions difficulty of diagnosis at times. The points of difference, however, are usually so marked that error should not occur.

Sycosis non-parasitica is a chronic, inflammatory, *non-contagious* affection of the hair-follicles, characterized by the development of papules and pustules which are perforated with hairs, the hairs themselves being unaffected. The upper lip, cheeks, and chin are the parts mostly involved. If of long duration, some inflammatory thickening results.

In tinea sycosis, or sycosis parasitica, the skin and subcutaneous connective tissue are extensively involved, as manifested by the induration and formation of the characteristic tubercles. The upper lip is rarely invaded; the hairs are diseased, broken off, or loose, and under the microscope reveal the parasite.

Pustular eczema resembles tinea sycosis, with extensive pustulation and crusting; but in the former the hairs are not involved, nor are the characteristic tubercles present.

Treatment. Local measures are sufficient for the cure of tinea sycosis. In the majority of instances the following procedure will effect a cure in three or four weeks. If crusts are present,—and almost always some are,—they are to be thoroughly saturated with inunctions

of almond or olive oil, and removed by washing with soft soap and water. The part is then cleanly shaved, the first operation being more painful than subsequent ones. After shaving, the affected surface is bathed for ten minutes in water as hot as can be borne. All pustules are then opened with a fine needle, and the parts sponged freely for several minutes with a solution of *sodii hyposulphitis*, ʒj (4 Gm.); *aquæ*, fʒj (30 Cc.); after which the parts are again thoroughly washed with hot water, carefully dried, and smeared with an *unguentum sulphuris*, containing ʒj–ij (4–8 Gm.) to the ounce. This procedure is preferably performed at night. The following morning the ointment is washed off with soap and water, the face bathed with the sodium solution, and dusted with any inert powder. This plan continued faithfully every night, omitting the shaving when the beard has not grown much, will usually be followed with success.

Cases resisting the above means should, in addition, have the hairs depilated, the shaving performed every two or three days, thus allowing time for the hairs to grow sufficiently to depilate, the operation seldom being as painful as one would suppose. Shaving and depilation upon alternate days should be faithfully practised until the new hairs are healthy.

In addition to the parasiticides mentioned, any of those recommended for the other vegetable parasitic diseases may be used.

TINEA VERSICOLOR.

Synonyms. Pityriasis versicolor; liver-spots.

Definition. A *contagious*, parasitic affection of the skin, due to the *microsporon furfur;* characterized by the occurrence of variously sized, irregularly shaped, dry, slightly furfuraceous, yellowish spots upon the chest or other portions of the body.

Cause. Pityriasis versicolor is the result of the presence upon the surface of the skin of a vegetable fungus termed *microsporon furfur*. It is a mildly contagious affection seen after puberty. It is said to occur most frequently in those suffering from wasting diseases, particularly phthisis pulmonalis. It is not connected with any affection of the liver, as supposed by the laity.

Pathology. The fungus permeates the horny layer of the epidermis, never the hairs or nails, and gives rise to the irregular-

shaped and sized maculæ, of a yellowish or brownish color. As a rule, it gives rise to neither hyperæmia nor inflammatory symptoms.

Symptoms. Tinea versicolor occurs in the form of irregular, roundish, circumscribed, or reticulated maculæ. The spots vary in size from that of a small silver coin to that of the hand. By coalescing they often cover a greater portion of the chest, their most usual site. Upon close inspection the surface of the macule is seen to be covered with furfuraceous scales, and, if the scales be not visible, scraping with the finger-nail will demonstrate their presence. In color the spots vary from a delicate buff or fawn shade to a yellowish, deep brown, and, rarely, even blackish hue. At times mild itching accompanies the eruption.

Diagnosis. The character of the eruption is so distinct that errors in diagnosis can hardly occur. If any doubt exist, a few of the scales upon a glass slide, with a drop of *liquor potassæ*, and covered with a thin glass cover and placed under a microscope with a power of from two hundred and fifty to five hundred diameters will readily determine the presence of the fungus.

Prognosis. Favorable.

Treatment. Mild galvanism over the discolorations is valuable. The parts should be cleansed with soap and water and either of the following lotions applied:

℞. Sodii sulphitis, ... ℥ iij 12. Gm.
Glycerini, ... f℥ ij 8. Cc.
Aquæ, ... ad f℥ iv ad 120. Cc. M.
Sig.—Apply frequently.

Or—

℞. Hydrargyri chlorid. corrosiv., . gr. iv 0.26 Gm.
Alcoholis, ... f℥ vj 24. Cc.
Ammonii chlorid., ... ℥ ss 2. Gm.
Aquæ rosæ, ... ad f℥ vj ad 180. Cc. M.
Sig.—Apply frequently. (Tilbury Fox.)

SCABIES.

Synonym. The itch.

Definition. A *contagious*, animal parasitic disease of the skin, due to the *acarus*, or *sarcoptes scabiei;* characterized by the formation of cuniculi (burrows), papules, vesicles, and pustules; followed by excoriations, crusts, and general cutaneous inflammation, and accompanied by itching.

Cause. Contagion. The only cause is the presence of the animal parasite, the *acarus*, or *sarcoptes scabiei*. The affection occurs at all ages and in every walk of life.

Pathology. Scabies is an inflammation of the skin with the development of papules, vesicles, pustules, excoriations, and subsequent crusting, the result of the ravages of the animal parasite, together with the irritation produced by the scratching of the patient.

The parasite *acarus*, or *sarcoptes scabiei*, is a minute creature, barely visible to the naked eye as a yellowish-white, rounded body. The female is the most commonly met with; the males are said to take no part in causing the affection, and so are rarely seen. They are said to die in about a week after copulation with the female. The female finds her way by boring through the horny layer into the mucous layer of the epidermis, and, being impregnated, begins at once laying her eggs and at the same time making her burrow. A variable number of eggs are deposited, usually about a dozen, after which she perishes in the skin. The ova hatch out in six or ten days.

Symptoms. Scabies is an artificial dermatitis or eczema, according to the amount of irritation produced by the presence of the parasite and the traumatism resulting from the severe scratching of the patient.

Immediately upon the arrival of the itch mite upon the skin it begins its work of burrowing, and very soon a burrow, or *cuniculus*, is formed, in which the eggs are deposited, and which also becomes the habitat of the female during the remainder of her life. The ova are hatched in about one week after their deposit, and at once begin to care for themselves and to burrow, resulting in the formation of as many additional *cuniculi* as there are active female mites. It is the presence of these burrowing parasites that constitutes the irritation resulting in the inflammation of the skin, characterized by the formation of minute *papules*, *vesicles*, and *pustules*, with more or less inflammatory induration. Add to these the *excoriations*, *scratch marks*, *fissures*, *torn vesicles*, *and pustules with yellow and bloody crusts*, caused by the scratching, and a picture of the fully developed disease is seen.

The *burrow*, or *cuniculus*, as it is termed, is formed by the mite entering and making its way beneath the horny layer of the epidermis, which is raised, very much as a mole undermines the ground. It occurs as a slight linear elevation of the epidermis, varying from a

half a line to four or five lines in length, and having an irregular or tortuous course. Its color is whitish or yellowish, speckled here and there with dark dots. At either end the cuniculus terminates as darkish points, the more prominent of which represent the parasite.

The *papules* are the first inflammatory lesion, are numerous and of small size, and may be the extent of the disease.

The *vesicles* are the next stage, varying in size and number, having an inflamed base, sometimes presenting cuniculi upon their summits.

The *pustules* represent the completion of the inflammatory action, their size and number varying with the severity of the irritation.

The *intense itching*, which is worse at night, results in excoriations, torn papules, vesicles, and pustules, followed by crustings, which after a time disguise the characteristic lesions. The regions of the body attacked are the hands, especially the sides of the fingers and the folds where they join the hands. After a time the wrists, penis, and mammæ, and around about and upon the nipples, are invaded.

Persons predisposed to eczema have this affection developed, in addition to the simple dermatitis, by the ravages of the itch mite.

Diagnosis. A case of scabies seen before irritated by scratching presents no difficulty in diagnosis. The presence of the burrows always suffices for the diagnosis, but these are not always discoverable. The location of the eruption always points strongly to scabies. A history of contagion is of value. All doubt can be set at rest by the aid of the microscope.

Prognosis. Always favorable, relapses only occurring when the treatment has been imperfectly carried out or when the individual has recontracted the disease.

Treatment. Local measures are alone required in the treatment of scabies. The strength of the parasiticides must be controlled by the severity of the inflammatory symptoms present. If eczema complicate scabies, it is to be treated as an ordinary attack after the death of the itch mites.

Scabies always succumbs to the following plan: The patient is to be thoroughly washed with soft soap and water, followed by a warm bath, after which cover eruption with *tinctura benzoini*, which immediately modifies the itching, or one of the following ointments is to be thoroughly rubbed into every portion of the body, especial attention being devoted to the hands, fingers, and other parts usually the seat of the disease:

℞. Styracis liquidis, ... f℥ij 8. Cc.
Ung. sulphuris, ... ℥ij–iv 8.–16. Gm.
Ung. petrolei, ... ad ℥j ad 30. Gm. M.
Sig.—Apply after washing. (Bulkley.)

Or—

℞. Sulphuris sublimat., ... ℥j 4. Gm.
Balsam Peruviani, ... ℥ss 2. Gm.
Adeps, ... ℥j 30. Gm. M.
Sig.—For children. (Duhring.)

Or—

℞. Creolini, ... gr. x 0.6 Cc.
Ung. petrolei, ... ℥ij 60. Gm. M.
Sig.—Apply thoroughly.

PEDICULOSIS.

Synonyms. Phthiriasis; morbus pedicularis; lousiness.

Definition. A *contagious*, animal parasitic disease of the head, body, or pubes, due to the presence of pediculi and characterized by the wounds inflicted by the parasite, together with excoriations and scratch marks.

Varieties. *Pediculosis capitis; pediculosis corporis; pediculosis pubis.*

Cause. The cause is the presence of the parasite, the result of contagion, direct or indirect. The view of "a spontaneous generation" of pediculi is not accepted by the great majority of observers.

Pathology. The lesion produced by the presence of the pediculi is a minute hemorrhage, caused by the parasite inserting its sucking apparatus, or, as it is termed, its haustellum, into a follicle, and obtaining blood by a process of sucking, and not by biting, as is generally supposed. The presence of the parasite in any great numbers brings about a peculiar irritable state of the skin, which gives rise to an irresistible desire to scratch, as a consequence of which the surface is markedly excoriated and lacerated.

Symptoms. The symptoms which arise from the presence of the parasite in different localities are somewhat different, and call for separate consideration.

Pediculosis capitis. This variety is caused by the presence of the pediculus capitis, or head louse. The *ova*, or *nits*, are readily recog-

nized at a distance. Their favorite seat is the occipital region, either upon the surface of the scalp or upon the hair. Their presence gives rise to considerable irritation, itching, and consequent scratching, resulting in the wounding of the scalp, with oozing of a serous or purulent fluid mixed with blood, which soon mats the hair and forms into crusts. In those predisposed to eczema the presence of the parasite will give rise to that condition.

The general health is usually unaffected by the presence of the pediculi.

Pediculosis corporis. This variety of the pediculosis is caused by the presence of the pediculus corporis, or body louse, or more properly termed the pediculus vestimenti, or clothes louse. Its color, when devoid of blood, is dirty-white or grayish, with a dark line around the margin of its abdomen. Its habitat is the clothing covering the general surface, remaining upon the skin only long enough to obtain sustenance. The ova are usually deposited in the seams of the clothing, the lice being hatched within the week. Occasionally a few of the pediculi may be observed crawling about the surface, or in the act of drawing blood. As they move over the surface they give rise to an intensely disagreeable itching sensation, to relieve which the patient scratches, which in turn gives rise to the characteristic lesions of the affection.

The *lesions* are numerous. The scratch marks are scattered here and there, either long and streaked, in other places short and jagged, the excoriations and blood-crusts varying in size from a pin-head to a split pea or even larger, with irregular-shaped pustules. In addition to the lesions resulting from the scratching are seen the *primary* lesions, consisting of minute, reddish puncta with slight areolæ, the points at which the parasite has drawn blood. In cases of long standing a brownish pigmentation of the whole skin may result from the long-continued irritation and scratching. The favorite site of the lesions are the back, especially about the scapular region, the chest, abdomen, hips, and thighs.

Pediculosis is seen most commonly among the poorer classes, and especially the middle-aged and elderly.

Pediculosis pubis. This variety of pediculosis is caused by the presence of the pediculus pubis, or crab louse. Although having its seat of predilection about the pubes, it may also infest the axillæ, sternal region in the male, beard, eyebrows, and even eyelashes.

They may be found crawling about the hairs, but more commonly hugging the surface closely. They infest adults chiefly, and occasion symptoms similar to those described in connection with other species. They are usually contracted through sexual intercourse, although occasionally they are present in cases in which they have not been communicated in this way, and where no explanation as to the mode of contagion can be suggested. The *itching* varies from slight to severe.

Diagnosis. When violent itching exists in any case, without marked eruption, the possibility of the presence of pediculi should always be entertained, and if carefully sought after, are found.

Prognosis. Favorable, if the treatment be thoroughly carried out.

Treatment. Local measures alone are all that is necessary for the removal of the various forms of pediculosis.

Pediculosis capitis. The most effective application to this variety is to thoroughly soak the head two or three times a day with ordinary *petroleum* or *kerosene oil*, and keep it wrapped in a cloth for twenty-four hours. At the end of this time the head should be thoroughly washed with soft soap and hot water, dried, and saturated with the official *unguentum hydrargyri ammoniatum.* If required, this entire procedure may be repeated, but usually any pediculi escaping the petroleum are destroyed by the unguentum.

Pediculosis corporis. In this variety the habitat of the parasite being the clothing, they must be boiled or baked at a temperature sufficiently high to destroy their life. After this the clothing should be changed every day or two, carefully inspected, and if pediculi are seen, they must again be baked or boiled. It is folly to expect satisfactory results unless these directions are faithfully adhered to. For the irritation, itching, and excoriations, mild alkaline baths or lotions of *acidum carbolicum* are sufficient.

Pediculosis pubis. The parts should be washed twice daily with soft soap and water, after which the thorough application of *tinctura cocculus indicus*, full strength or diluted, or a lotion of *hydrargyri chloridum corrosivum* or *unguentum hydrargyri ammoniatum* or *unguentum hydrargyri* (blue ointment), will be effectual.

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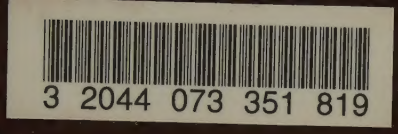
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